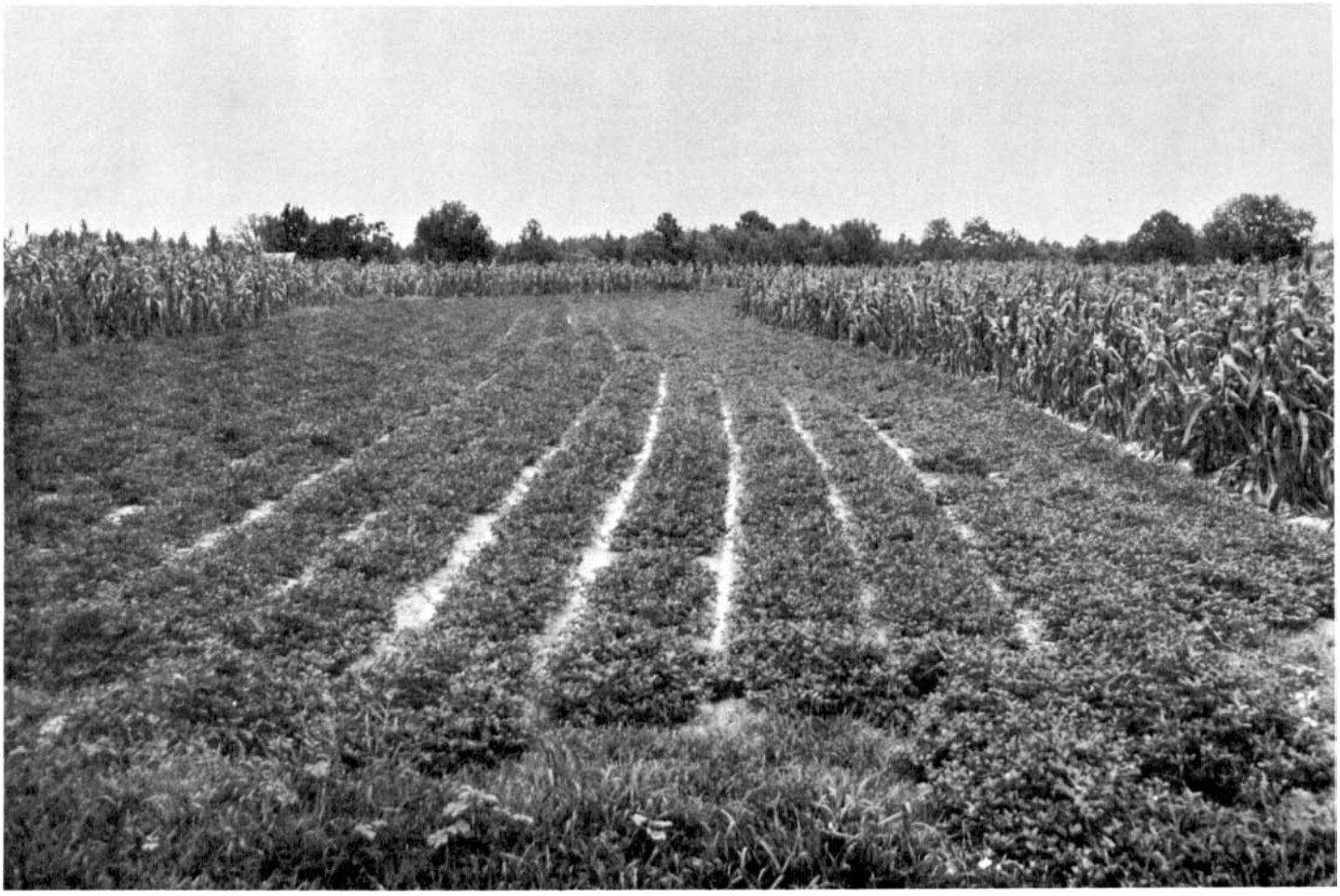
Series 1960, No. 4

Issued May 1963

SOIL SURVEY

Twiggs County, Georgia



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

HOW TO USE THE SOIL SURVEY

THIS SOIL SURVEY of Twiggs County, Ga., will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid foresters in managing woodland; and add to our knowledge of soil science.

Locating Soils

Use the index to map sheets at the back of this report to locate areas on the large map. The index is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. When the correct sheet of the large map has been found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they occur on the map. The symbol is inside the area if there is enough room; otherwise, it is outside the area and a pointer shows where the symbol belongs.

Finding Information

This report contains sections that will interest different groups of readers, as well as some sections that may be of interest to all.

Farmers and those who work with farmers can learn about the soils in the section "Descriptions of Soils" and then turn to the section "Use and Management of Soils." In this way, they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The "Guide to Mapping Units" at the back of the report will simplify use of the map and report. This guide lists each soil and land type mapped in the county, and the page where each is described. It also lists, for each soil and land type, the capability unit and woodland suitability group, and the pages where each of these are described.

Foresters and others interested in woodland can refer to the subsection "Woodland." In that subsection the soils in the county are grouped according to their suitability for trees, and factors affecting the management of woodland are explained.

Engineers will want to refer to the subsection "Engineering Applications." Tables in that subsection show characteristics of the soils that affect engineering.

Scientists and others who are interested will find information about how the soils were formed and how they are classified in the section "Formation and Classification of Soils."

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Newcomers in Twiggs County will be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the Area," which gives additional information about the county.

* * * * *

Fieldwork for this survey was completed in 1960. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time. The soil survey of Twiggs County was made as part of the technical assistance furnished by the Soil Conservation Service to the Twiggs County Soil and Water Conservation District.

***Cover picture.*—Corn and peanuts on contoured field of class II land. Note the sod waterway in the lower left corner.**

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SOIL SURVEY OF TWIGGS COUNTY, GEORGIA

REPORT BY JOHN C. WOODS, SOIL CONSERVATION SERVICE

H. J. BYRD, FRANK T. RITCHIE, AND J. W. CALHOUN, SOIL CONSERVATION SERVICE, HELPED PREPARE THE REPORT, AND ASSISTANCE OF OTHERS IS ACKNOWLEDGED IN SECTIONS ON CAPABILITY UNITS, WOODLAND, WILDLIFE, AND ENGINEERING

SOILS SURVEYED BY JOHN C. WOODS, W. C. PLAYER, AND R. W. CRAFT, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE, AGRICULTURAL EXPERIMENT STATIONS

TWIGGS COUNTY is in the geographic center of Georgia (fig. 1). The total area is about 233,600 acres, or 365 square miles. Jeffersonville is the county seat. The county is bordered on the north by Bibb and Jones Counties, on the east by Wilkinson County, on the south by Bleckley County, and on the west by Houston County. The southeastern corner of Twiggs County touches the northwestern corner of Laurens County. Most of the western boundary of Twiggs County is the Ocmulgee River.

The climate of Twiggs County is the warm-temperate, humid type; rainfall is abundant and generally well distributed. General farming is the main activity, but there are a few local industries. The principal crops are corn, peanuts, cotton, soybeans, small grains, pecans, nursery stock, and truck crops. Cash crops are cotton, peanuts, pecans, truck crops, and nursery stock.

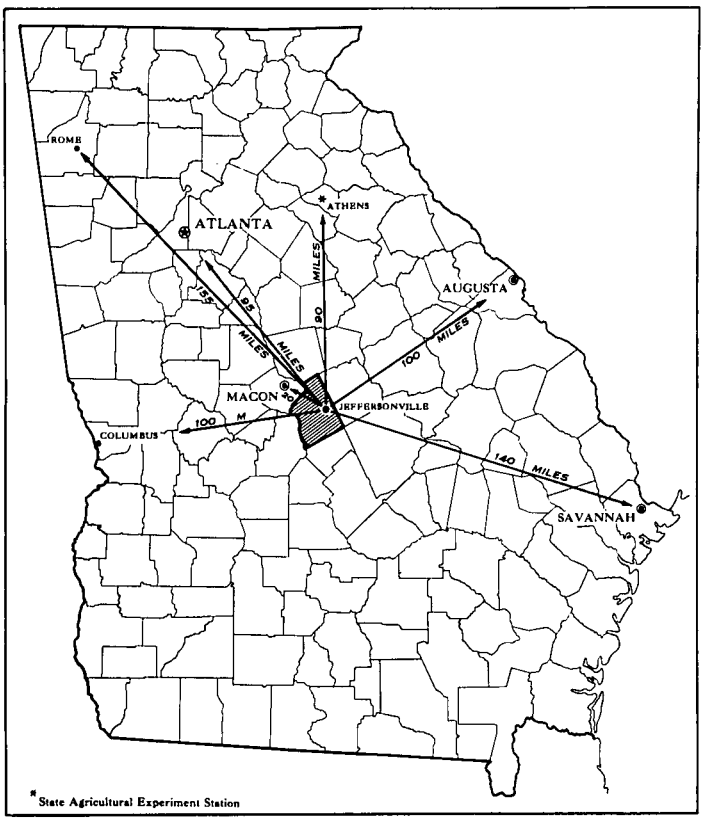

Figure 1.—Location of Twiggs County in Georgia.

The most extensive and agriculturally important soils in the county are the well-drained, loamy Orangeburg soils on long, winding ridgetops and on side slopes. These soils make up about one-fourth of the county and much of the cultivated acreage. Other extensive soils are the excessively drained, sandy Lakeland and Eustis soils that occur on the broad, gently sloping divides. These soils together make up more than one-fifth of the county, but they are much less important agriculturally than the Orangeburg soils.

The Greenville and Norfolk soils make up about one-eighth of the county and are suited to farming. Red Bay, Americus, Ruston, and Tifton soils produce well but have a small total acreage.

Soils formed from water-laid materials are along streams, and different minor soils are in the uplands. Soil patterns are shown in the section "General Soil Map." Each kind of soil is shown on a large map and is described in the section "Descriptions of Soils."

General Nature of the Area

This section describes natural and cultural features of Twiggs County and should be especially helpful to those who are unfamiliar with the county.

Physiography and Relief

Twiggs County is made up of three physiographic areas. From north to south these areas are (1) the Sandhills, (2) the upper Coastal Plain, and (3) the middle Coastal Plain.

The Sandhills area is a narrow belt of deep sands in the northern part of the county, just below the fall line. It is rolling to hilly and is dissected by many narrow valleys and drainageways. It makes up about 20 percent of the county.

The upper Coastal Plain is south of the Sandhills and makes up about 70 percent of the county. Geologically

it is the oldest part of the county. Ridges are broad and very gently sloping, and steep side slopes extend from the hilltops. Many streams and drainageways dissect the area. The upland divides are smoother and broader than the Sandhills, and the streams and their flood plains between the divides are broader and farther apart.

The middle Coastal Plain makes up about 10 percent of the county and is in the southeastern part. It is undulating and rolling and has a less well developed drainage system than has the upper Coastal Plain.

The elevation at Jeffersonville is about 525 feet above sea level. Other approximate elevations in the county are as follows: Dry Branch, 500 feet; Bullard, 368 feet; Tarversville, 453 feet; Danville, 450 feet; and Marion, 370 feet.

Drainage

The Ocmulgee River flows along the western boundary of the county and, with its tributaries, drains all of the county except the eastern third. The eastern third is drained by streams that empty into the Oconee River outside of the county. Big Sandy, Ugly, and Alligator Creeks empty into the Oconee River. The tributary streams of each river have their own small tributaries that branch into all parts of the county and form a well-defined trellis pattern.

Except for the flood plains and drainageways, the county is well drained. Because sediment washed from the uplands has filled stream channels in many places, excess water drains away slowly and flood plains are swampy or wet much of the time. In these wet areas planting is often delayed during periods of heavy rainfall because water backs up and covers fields.

Water Supply

Water for household use and for livestock is adequate except in periods of extremely dry weather. Shallow wells and springs supply the farm homes. Generally, a well 40 to 60 feet deep will furnish a dependable supply of water throughout the year. Water for livestock is from springs, branches, farm ponds, and streams. In Jeffersonville a deep well supplies water for a city pressure system. Farm ponds, creeks, and the Ocmulgee River furnish adequate fishing, boating, swimming, and other forms of recreation.

Vegetation

The native vegetation of Twiggs County consisted of an oak-pine forest like the one that covered much of the eastern part of the United States. Some of the native vegetation still exists on the steeper slopes. In 1958 about 82 percent of the county, or 192,113 acres, was woodland. Most wooded areas of the upland are in loblolly pine and some red oak, turkey oak, black oak, gum, and hickory. The low bottom lands are in gum, poplar, water-loving oaks, and a few cypress.

Recently many acres of agricultural land have been planted to pines. Where seed trees are sufficient and the area is protected from fire, pines are reseeding naturally. Because the county has a good fire-control system, the number of forest fires is small.

Climate

The climate of Twiggs County is humid and temperate. Summer is long and hot. During the summer months, temperatures average about 80°F. and temperatures exceeding 90° are common. Winter is short and mild. During the winter months, temperatures average about 50°. Table 1 gives climatic data compiled from the records of the United States Weather Bureau Station at Macon, in adjacent Bibb County.

Rainfall is uniform throughout the county and is fairly well distributed through the year. It is generally heavier in spring and early summer and lighter in the fall than it is in other seasons. Snowfall, which seldom occurs in this county, is very light.

The average frost-free season is 246 days. It extends from about March 15 to about November 16. In this long growing season, many kinds of crops can be grown.

Tornadoes seldom occur in Twiggs County. These storms generally occur in the spring, but they may occur in any season. Although thundershowers are common in summer, severe thunderstorms are rare. Thunderstorms occasionally are accompanied by strong winds and hail that damage crops, but other property is seldom damaged.

TABLE 1.—*Temperature and precipitation at Macon, Bibb County, Georgia*

[Elevation, 356 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1954)	Wettest year (1929)	Average snowfall
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December	48.2	79	16	3.98	2.23	3.52	(3)
January	48.1	84	15	3.59	.69	4.48	.3
February	49.8	83	10	4.45	1.63	12.04	(3)
March	56.6	95	19	4.86	3.92	10.89	(3)
April	64.2	93	33	3.64	2.62	2.22	0
May	72.4	99	42	3.14	2.59	2.52	0
June	79.1	106	48	3.66	.99	8.54	0
July	80.8	103	61	5.18	3.06	1.87	0
August	80.3	104	55	4.25	2.07	3.08	0
September	75.8	102	45	3.13	1.85	5.95	0
October	65.3	100	26	2.24	1.28	7.49	0
November	54.9	88	10	2.50	3.12	5.20	(3)
Year	64.7	106	10	44.62	26.05	67.80	.3

[1] Average temperature based on a 62-year record, through 1961; highest and lowest temperatures based on a 13-year record, through 1961.

[2] Average precipitation based on a 62-year record, through 1961; wettest and driest years based on a 56-year record, in the period 1906–1961; snowfall based on a 13-year record, through 1961.

[3] Trace.

Schools and Churches

The county has two consolidated high schools in Jeffersonville and seven elementary schools scattered throughout the county. School buses transport children to all schools. Churches of several denominations are located

throughout the county. The county does not have a hospital, but several are nearby at Macon.

Transportation and Markets

Twiggs County has adequate railroads and highways. A line of the Southern Railway crosses the county from north to south near the western boundary. Produce can be shipped north on this line to Macon, in Bibb County, or south to McRae, in Telfair County. The Seaboard Air Line Railway passes through Jeffersonville as it crosses the county from Dry Branch to Danville. Produce can be shipped on this line north to Macon or south to Savannah.

U.S. Highway No. 80 enters the county at Dry Branch and extends southeast through Jeffersonville to Danville. Interstate Highway No. 16 is planned for construction and will parallel U.S. Highway No. 80 from Jeffersonville to Macon. U.S. Highway Nos. 129 and 23 enters the county about 5 miles south of Dry Branch, passes south through Tarversville, and runs on to Cochran, in Bleckley County.

The county is served by several paved State highways, three of which pass through Jeffersonville. Graded and improved dirt roads branch out into all parts of the county. Farmers can get to markets on these roads except in extremely wet periods.

Most of the farm products are sold in Macon at a State farmers' market, and some are sold locally.

Industry

The two main industries in Twiggs County are mining and processing kaolin, and gathering and processing wood. Much kaolin is mined in the northern part of the county and processed and refined in two plants. Several hundred people are employed in this industry.

The main forest products are saw logs, pulpwood, firewood, and fenceposts. The sale of standing timber accounts for almost half of the total income from forests. Logs are cut by 10 to 15 mobile sawmills. A planing mill in Jeffersonville processes lumber, but most of the pulpwood is shipped to two large pulpmills in Macon.

Agriculture

This subsection contains data on the size, number, and type of farms in the county; farm tenure; principal crops and pasture; and livestock.

Number, size, and type of farms

In 1959 there were 406 farms in Twiggs County, a decrease of 377 farms since 1950. The average size farm in 1959 was 193 acres. The census of agriculture lists the farms in the county in 1959 as follows:

Type of farm	*Number of farms*
Field crop other than vegetable	75
Dairy	3
Livestock other than dairy	38
General	32
Miscellaneous and unclassified	258

The 1959 census lists the number of different-sized farms and their acreage as follows:

	Number of farms
Less than 10 acres	31
10 to 49 acres	122
50 to 69 acres	44
70 to 99 acres	41
100 to 139 acres	40
140 to 179 acres	24
180 to 219 acres	22
220 to 259 acres	12
260 to 499 acres	30
500 to 999 acres	24
1,000 or more acres	16

Farm tenure

In 1959, full owners operated 198 farms, or 49 percent of all the farms in the county; part owners operated 18 percent, and tenants 33 percent. Only one farm was operated by a farm manager. On the 135 farms operated by tenants, 105 tenants paid cash rent and the rest were tenants operating under unspecified agreements with the owners.

Crops and pasture

Table 2 lists the acreage of principal crops and number of bearing fruit and nut trees in Twiggs County in 1949, 1954, and 1959. In those years corn occupied the largest acreage, but the acreage in corn has steadily decreased since 1949. Cotton, the second largest crop, and peanuts, the third largest, have also decreased in acreage since 1949.

The acreage of small grains, pasture, and hay crops has decreased since 1954. Some of the acreage not used for cultivated crops has been planted to pasture and hay, but a larger part has been planted to pine trees. The number of acres pastured in 1954 and 1959 is listed in the U. S. Census of Agriculture as follows:

	1954	*1959*
Cropland pastured	4,900	4 409
Woodland pastured	19,078	11,795
Other pasture	3,918	5,624
	27,896	21,828

TABLE 2.—*Acreage of principal crops and number of bearing fruit and nut trees in stated years*

Crops	1949	1954	1959
	Acres	*Acres*	*Acres*
Corn for all purposes	15,063	12,568	9,420
Cotton harvested	5,776	3,755	2,224
Oats threshed	267	1,801	1,049
Hay, except sorghum	87	986	540
Cowpeas, except for processing	2,340	364	488
Peanuts for all purposes grown alone	3,416	1,476	1,147
	Number [1]	*Number*	*Number*
Peach trees	21,334	159	100
Apple trees	354	45	23
Pear trees	380	46	66
Pecan trees	9,077	1,610	2,481

[1] One year later than year given at head of column.

Fruit practically vanished from the agricultural economy of Twiggs County between 1949 and 1959, during which time the number of bearing trees decreased 99 percent. The number of pecan trees decreased 72.7 percent in the same period.

Livestock

Table 3 lists the number of livestock on farms in 1950, 1954, and 1959. The value of livestock and livestock products in 1949 was $232,150, or 24 percent of all farm income. In 1959 the value was $439,657, or 44 percent.

TABLE 3.—*Number of livestock on farms in stated years*

Livestock	1950	1954	1959
Horses and mules	1, 244	714	358
Cattle and calves	3, 775	4, 622	3, 863
Hogs and pigs	7, 020	5, 967	7, 407
Chickens 4 months old and over	15, 784	8, 755	6, 905

How Soils Are Named, Mapped, and Classified

Soil scientists made this survey to learn what kinds of soils are in Twiggs County, where they are located, and how they can be used. They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down to the rock material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to uniform procedures. To use this report efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Greenville and Norfolk, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in natural characteristics.

Many soil series contain soils that are alike except for texture of their surface layer. According to this difference in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Greenville sandy loam and Greenville clay loam are two soil types in the Greenville series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into soil phases. The name of a soil phase indicates a feature that affects management. For example, Greenville sandy loam, 2 to 5 percent slopes, is one of several phases of Greenville sandy loam, a soil type that ranges from nearly level to moderately steep.

After a fairly detailed guide for classifying and naming the soils had been worked out, the soil scientists drew soil boundaries on aerial photographs. They used photos for their base map because they show woodlands, buildings, field borders, trees, and similar detail that greatly help in drawing boundaries accurately. The soil map in the back of this report was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area consisting dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientist has a problem of delineating areas where different kinds of soils are so intricately mixed, and in individual tracts so small in size, that it is not practical to show them separately on the map. Therefore, he shows this mixture of soils as one mapping unit and calls it a soil complex. Ordinarily, a soil complex is named for the major soil series in it, for example, Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded. Also, in most mapping, there are areas to be shown that are so rocky, so shallow, or so frequently worked by wind and water that they cannot be called soils. These areas are shown on a soil map like other mapping units, but they are given descriptive names, such as Gullied land, and are called land types rather than soils.

Only part of the soil survey was done when the soil scientist had named and described the soil series and mapping units, and had shown the location of the mapping units on the soil map. The mass of detailed information he had recorded then needed to be presented in different ways for different groups of users, among them farmers, managers of woodlands and rangelands, and engineers.

To do this efficiently, he had to consult with persons in other fields of work and jointly prepare with them groupings that would be of practical value to different users. Such groupings are the capability classes, subclasses, and units, designed primarily for those interested in producing the short-lived crops and tame pasture; woodland suitability groups, for those who need to manage wooded tracts; and the classifications used by engineers who build highways or structures to conserve soil and water.

General Soil Map

After he studies the soils in a locality and the way they are arranged, a soil scientist can make a general map that shows several main patterns of soils. Each kind of pattern is called a soil association. Such a map is the colored general soil map in the back of this report. Each association, as a rule, contains a few major soils and several minor soils, in a pattern that is characteristic although not strictly uniform.

The soils within any one association are likely to differ from each other in some or in many properties; for example, slope, depth, stoniness, or natural drainage. Thus, the general soil map shows, not the kind of soil at any particular place, but patterns of soils, in each of which there are several different kinds of soils.

Each soil association is named for the major soil series in it, but as already noted, soils of other series may also be present. The major soils of one soil association may also be present in another association, but in a different pattern.

The general map showing patterns of soils is useful to people who want a general idea of the soils, who want to compare different parts of a county, or who want to know the possible location of good-sized areas suitable for a certain kind of farming or other land use.

The seven soil associations in Twiggs County are shown in color on the general soil map at the back of this report and are described in the following pages.

Norfolk-Ruston-Tifton association: Well-drained soils on long, broad, level to gently sloping interstream divides

This association makes up about 15 percent of the county and is in a single area in the southeastern corner. The long, broad, nearly level ridgetops give way to gentle slopes that reach down to the narrow flood plains along the many drainageways.

The Norfolk, Ruston, and Tifton soils are dominant and are on ridgetops and side slopes. These are well-drained soils that developed in thick, unconsolidated beds of sand and sandy clay. Their surface soil is loamy sand but, in places, is fine sandy loam. The subsoil of the Norfolk soils is friable, yellowish-brown sandy clay loam, and that of the Ruston soils is friable, yellowish-red or red sandy clay loam. The Tifton soils have a friable sandy clay loam to sandy clay subsoil. Small, hard, rounded concretions of iron have accumulated on the surface and throughout the profile of the Tifton soils.

Minor soils of this association are the excessively drained Lakeland soils and Eustis soils, which are on ridgetops; well-drained Local alluvial land in the depressions and along drainageways; and Local alluvial land, wet, on the flood plains.

Norfolk soils make up about 40 percent of this association; Ruston soils, about 20 percent; Tifton soils, about 20 percent; and minor soils and land types, about 20 percent. About 80 percent of the association consists of soils in capability classes I and II. Capability classes are discussed in the section "Use and Management of Soils." About 60 percent of the acreage is cultivated.

Farms in this association average about 200 acres and are of the general type. The farms are operated full time by their owners. Cotton, corn, peanuts, and small grains are the main crops.

Greenville-Magnolia-Faceville association: Sandy loams on broad, level to gently sloping ridgetops and strongly sloping to steep side slopes

This association makes up about 10 percent of the county and occurs only in the southwestern part. It consists of broad, level to gently sloping ridegtops; adjacent strongly sloping to steep side slopes; and flood plains. The steeper, unprotected soils are severely eroded. The streams in this association are small, but their channels are fairly deep.

The Greenville, Magnolia, and Faceville soils are dominant and are on ridgetops and side slopes. These well-drained, deep, friable soils developed in thick beds of sand, loamy sand, sandy loam, and clay. Their surface layer is sandy loam or fine sandy loam. The Greenville soils, except where severely eroded, have a dark reddish-brown surface layer and a red to dark-red sandy clay subsoil. In severely eroded areas, their surface layer is clay loam. The surface layer of Magnolia soils is light grayish brown, and the subsoil is a dark-red sandy clay. Faceville soils have a light grayish-brown surface layer and a strong-brown to yellowish-red sandy clay subsoil.

In the small depressions of this association are poorly drained Grady soils. Small areas of Local alluvial land and Wet alluvial land occur in the drainageways and on the flood plains.

Greenville soils make up about 70 percent of this association; Magnolia soils, about 10 percent; Faceville soils, about 5 percent; and minor soils and land types, about 15 percent. Most of this association consists of soils in capability classes II and III. About 80 percent of the acreage is wooded.

Most farms in this association are small, but several are large. Most of the large ones are managed tree farms. Most fields on the small farms are idle or have grown up in trees, but some are in pasture or general crops.

Orangeburg-Red Bay-Americus association: Well-drained, reddish sandy loams and loamy sands on long, narrow, gently sloping to steep ridgetops, and on side slopes

This association makes up about 34 percent of the county and occurs in one area that occupies most of the central part. It consists of long, narrow, winding, gently sloping to steep ridgetops; adjacent steep side slopes; and flood plains. The steep side slopes extend from the gently sloping ridgetops to the flood plains. The flood plains are narrow along the many shallow drains in this association and are fairly wide along the few larger streams. Many areas are severely eroded and cut by deep, wide gullies.

The Orangeburg, Red Bay, and Americus soils are dominant and are on the ridgetops and side slopes. These well-drained soils developed in thick beds of sand and sandy clay. Their surface soil is sandy loam or loamy sand. The Orangeburg soils have a grayish-brown surface layer and a red to dark-red clay subsoil. The surface layer of Red Bay soils is dark reddish brown, and the subsoil is dark-red sandy clay. The Americus soils have a loamy sand surface soil and are more sandy than most other soils in the association.

Also on the ridgetops are small areas of somewhat excessively drained Eustis soils and well-drained Ruston soils. Local alluvial land and Local alluvial land, wet, occur in the drainageways. Wet alluvial land is on the flood plains.

Orangeburg soils make up about 70 percent of this association; Red Bay, about 10 percent; Americus, about 10 percent; and land types and minor soils, about 10 percent. About 70 percent of the association consists of soils in capability classes II and III. More than 80 percent of the acreage is wooded.

Farms in this association average about 200 acres and are mostly of the general type. Much of the association is in pasture (fig. 2); some farms have herds of dairy cattle

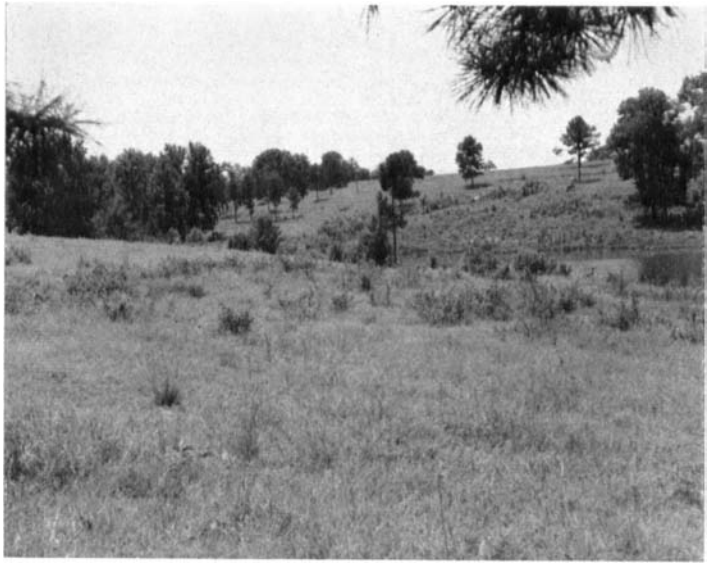

Figure 2.—**Coastal bermudagrass pasture in the Orangeburg-Red Bay-Americus soil association. Pasture is on Orangeburg loamy sand, 8 to 12 percent slopes, eroded; Local alluvial land, wet, is in the draw.**

or beef cattle. The farms are operated full time by their owners. Cotton, corn, peanuts, and small grains are the main crops.

Oktibbeha-Eutaw-Susquehanna-Binnsville association: Soils on ridges underlain by limestone, marl, or chalk, and on slopes

This association makes up about 2 percent of the county and is in the section called the Black Belt. It consists of long, narrow, gently sloping ridgetops; steep side slopes, and fairly wide flood plains. Some parts of the ridgetops are fairly broad. The steep slopes extend from the ridgetops to the flood plains or the drainageways. Streams and drainageways are numerous. A few of the larger streams have cut deep channels and have fairly wide flood plains. Many areas are severely eroded.

The Oktibbeha soils occupy more than half of this association. Oktibbeha and the Binnsville soils are on the ridgetops, and Eutaw and Susquehanna soils are on the side slopes. These major soils have rapid surface runoff. The Oktibbeha soils are moderately drained in the surface layer and are moderately to slowly drained in the subsoil. Binnsville, Eutaw, and Susquehanna soils are moderately to slowly drained in the surface layer and are very slowly drained in the subsoil.

The Oktibbeha, Eutaw, and Binnsville soils developed in thin beds of clay that are less than 4 feet thick over marl, chalk, or limestone. Susquehanna soils developed in thick beds of acid heavy clay. The surface layer of the major soils is dark gray and ranges from sandy loam to clay. It is underlain by grayish-white marl in the Binnsville soil. The subsoil in the Oktibbeha, Eutaw, and Susquehanna soils is red, gray, yellow, or light-gray heavy clay. Wet alluvial land is in the low drainageways.

Oktibbeha soil makes up about 60 percent of the association; Eutaw soils, about 20 percent; Susquehanna soils, about 10 percent; Binnsville soils, about 5 percent; and minor soils and land types, about 5 percent. About 80 percent of the association consists of soils in capability classes VI and VII. The association is in loblolly and shortleaf pines and various hardwoods.

Lakeland-Izagora-Wahee association: Level to very gently sloping, sandy soils on stream terraces

This association makes up 4 percent of the county and consists of level to very gently sloping soils in the western part. These soils are on terraces along the Ocmulgee River and along other large streams that flow through the county. The streams have fairly wide flood plains. Generally, the very gently sloping soils are adjacent to the streams and the level soils are adjacent to the upland.

The Lakeland, Izagora, and Wahee soils are dominant. The Lakeland soils are somewhat excessively drained. Their surface layer ranges from sand to loamy sand. The Izagora soils are deep, friable, and moderately well drained. Their surface layer is sandy loam and is underlain by sandy clay. The Wahee soils are somewhat poorly drained. They have a loamy sand surface layer and are underlain by clay or heavy clay loam. Wahee soils generally are on the lowest part of the landscape, and the more sandy Izagora soils are on the highest part.

Small areas of the somewhat excessively drained Eustis sand, terrace, are at the top of gentle slopes. Wet alluvial land is on the flood plains and in the drainageways.

The Lakeland soils make up 40 percent of this association; Izagora soils, about 20 percent; Wahee soils, about 30 percent; and minor soils and land types, about 10 percent. About 80 percent of this association consists of soils in capability classes II and III, and about 80 percent of the association is wooded.

A large acreage of this association is owned by pulpwood companies and by individuals. No large areas are cultivated; farming is done in small patches.

Chewacla-Wehadkee association: Narrow, level, somewhat poorly drained soils on flood plains along the Ocmulgee River

This association makes up about 5 percent of the county. It consists of level to nearly level flood plains or first bottoms along the Ocmulgee River and is likely to be flooded after heavy rains.

The Chewacla soils make up most of this association. These soils are somewhat poorly drained to moderately well drained. Their surface layer is very friable silt loam, about 16 inches thick. It is underlain by silt loam or silty clay loam mottled with light gray to grayish brown. The Wehadkee soils generally are somewhat lower than the Chewacla soils and are poorly drained. Their surface layer is friable silt loam, faintly mottled with brown. The subsoil is mottled, gray silty clay loam. Mica flakes occur in the Chewacla and Wehadkee soils.

The Chewacla soils make up about 86 percent of the association; Wehadkee soils, about 10 percent; and small areas of poorly drained Swamp, most of the rest. About 90 percent of this association consists of soils in capability subclasses IIw, IIIw, and IVw. About 90 percent of the acreage is wooded.

Lakeland-Eustis association: Somewhat excessively drained sands on broad, gently sloping divides, and sands over clay on knolls, ridges, and slopes

This association makes up about 30 percent of the county. Most of it is in the northeastern corner and along the northern border, but a smaller area is in the south-

western part. The association consists of broad, very gently sloping ridgetops; strongly sloping to steep side slopes; and narrow to fairly wide flood plains. Many drainageways and a few large streams dissect the association. The side slopes extend from the ridgetops to the narrow flood plains along the drainageways and to the fairly wide flood plains along the larger streams.

Lakeland and Eustis soils are dominant in this association, but there are also large areas of the land types, Sandy and clayey land, and Sands over kaolinitic deposits. The Lakeland and Eustis soils generally are on the ridges and side slopes. The land types are on the sharper breaks and on the steeper slopes along drains.

The Lakeland and Eustis soils are somewhat excessively drained. They developed in thick beds of sands and loamy sands. Their surface layer ranges from sand to loamy sand and is underlain by sandy clay loam to sandy clay at a depth of 5 to 10 feet. The subsoil of the Lakeland soils is pale yellow to light yellowish brown, and that of the Eustis soil is reddish brown to reddish yellow.

Sandy and clayey land and Sands over kaolinitic deposits are rapidly drained in the surface layer, but the underlying fine-textured, compact layer retards drainage in the subsoil. These land types vary in profile characteristics. They developed in beds of acid clay and sandy clay that contain thin layers of sandy material. The surface layer is generally grayish-brown loamy sand, but in eroded areas it is reddish-brown to almost white sandy clay loam. The subsoil is reddish-yellow to white, compact, tough heavy clay that is stratified and highly mottled with red, yellow, and light gray. It is very hard and brittle when dry. In some places the white kaolinitic material is near the surface, but in other places it is at a considerable depth.

The Lakeland soils make up 35 percent of this association; Eustis soils, about 30 percent; and Sandy and clayey land and Sands over kaolinitic deposits, about 30 percent. The rest of the association is made up of minor soils.

About 80 percent of this association consists of soils in capability classes III, IV, VI, and VII. About 90 percent of the acreage is woodland that includes many abandoned fields. Loblolly and shortleaf pines have grown up in these fields.

Most of the farms are small and have absentee owners. Farming is done in small patches by part-time farmers. Because the soils are droughty, crop yields are fair to poor.

Descriptions of Soils

In the following pages the soil series of Twiggs County are described in alphabetic order. Following a general description of a series, each soil in that series is described. For the first soil there is a brief description of its profile. That soil is typical of the series, and the reader is to assume that other mapping units in the series have essentially the same kind of profile. Differences in mapping units of the same series are indicated in the soil name or are stated in the text.

The approximate acreage, proportionate extent, and use of the soils are given in table 4, and their location can be seen on the detailed map at the back of the report. Many soil terms are defined in the Glossary and in the "Soil Survey Manual" (*7*).[1] Some terms are explained here so that the soil descriptions can be understood more readily.

To determine the precise color of a soil, soil scientists compare the color of a soil sample with that of a standard color chart. They indicate the precise color by a Munsell notation, and they also provide the equivalent in words for readers not familiar with the Munsell system. In this section only words are used to describe color, but both words and Munsell notations are given in the section "Formation and Classification of Soils."

The textural name of a soil refers to its content of sand, silt, and clay. Texture is determined by the way the soil feels when it is rubbed between the fingers and is checked further by laboratory analyses. Each soil is identified by a textural name, such as silt loam, which refers to the texture of the surface layer.

Structure is indicated by the way the individual soil particles are arranged in larger grains, or aggregates, and the amount of pore space between grains. The structure of a soil is determined by the distinctness, the size, and the shape of aggregates. For example, a soil may have a weak, fine, granular structure. Generally, only the shape of aggregates is given in this section.

Friable, firm, plastic, and other terms are used to describe consistence. Soil scientists estimate consistence by the way a soil feels.

Americus Series

The Americus series consists of somewhat excessively drained, reddish sandy soils that are gently sloping and on uplands. The soils developed from moderately thick beds of acid loamy sand and sand. They are medium acid or strongly acid.

The Americus soils are associated with the Greenville, Orangeburg, Red Bay, and Eustis soils. They are similar to the Greenville and Red Bay soils in color but lack the fine-textured subsoil of those soils. They are darker colored and more sandy throughout their profile than the Orangeburg soils and are redder throughout their profile than the Eustis soils.

The Americus soils are in the central part of the county. The total acreage is small but is fairly well distributed. Most of the acreage has been cultivated, but most fields are now idle or have grown up in pines and hardwoods. Because they are droughty, sandy, and contain only a small amount of plant nutrients and organic matter, Americus soils produce only fair yields of most crops grown locally.

Americus loamy sand, 2 to 5 percent slopes (ArB).—This is a very deep, somewhat droughty, loose soil on uplands. A brief description of a profile follows:

0 to 9 inches, dark-brown, loose loamy sand that is dark reddish brown in the lower part.
9 to 98 inches, dark-red loamy sand.

The surface layer is lighter colored than dark brown in some areas. A few small areas of sand are included. Also included are small areas of Red Bay and Eustis soils.

This soil contains little organic matter, is low in fertility, and is medium acid or strongly acid. It has a low available moisture supply and is droughty in dry periods. Water moves into and through the soil rapidly.

[1] Italic numbers in parentheses refer to Literature Cited, page 62.

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TABLE 4.—*Approximate acreage and proportionate extent of soils and use of soils at time of the survey*

Soils	Use				Total	
	Cultivated crops	Pasture	Forest	Idle	Area	Extent
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Percent*
Americus loamy sand, 2 to 5 percent slopes	48	0	601	24	673	0.3
Binnsville clay, 2 to 8 percent slopes, eroded			415		415	.2
Chewacla silt loam			9,875		9,875	4.2
Eustis loamy sand, shallow, 0 to 5 percent slopes	173	96	404	96	769	.3
Eustis loamy sand, shallow, 5 to 8 percent slopes	361		1,059	72	1,492	.6
Eustis sand, 2 to 5 percent slopes	601	795	3,616	577	5,589	2.4
Eustis sand, 5 to 8 percent slopes	120		2,381	24	2,525	1.1
Eustis sand, 8 to 12 percent slopes			1,852		1,852	.8
Eustis sand, terrace			530		530	.2
Faceville fine sandy loam, 2 to 5 percent slopes, eroded	368	192	160	168	888	.4
Faceville fine sandy loam, 5 to 8 percent slopes, eroded		240	120	96	456	.2
Grady sandy loam		48	600	73	721	.3
Greenville clay loam, 8 to 12 percent slopes, severely eroded			6,351		6,351	2.7
Greenville clay loam, 12 to 17 percent slopes, severely eroded			2,573		3,573	1.1
Greenville clay loam, 17 to 30 percent slopes, severely eroded			1,725		1,725	.7
Greenville sandy loam, 0 to 2 percent slopes	395				395	.2
Greenville sandy loam, 2 to 5 percent slopes	400			40	440	.2
Greenville sandy loam, 2 to 5 percent slopes, eroded	134		532		666	.3
Greenville sandy loam, 5 to 8 percent slopes, eroded			952		952	.4
Greenville sandy loam, 8 to 12 percent slopes, eroded			318		318	.1
Gullied land			150		150	.1
Izagora sandy loam	1,020	135	2,010	75	3,240	1.4
Lakeland loamy sands, shallow, 2 to 5 percent slopes	938		1,491	120	2,549	1.1
Lakeland loamy sands, shallow, 5 to 8 percent slopes			1,624		1,624	.7
Lakeland sands, 0 to 5 percent slopes	361	289	1,732		2,382	1.0
Lakeland sands, 5 to 8 percent slopes			1,544		1,544	.7
Lakeland sands, 8 to 12 percent slopes			608		608	.3
Lakeland sand, terrace			1,425		1,425	.6
Local alluvial land	553	72	2,261	24	2,910	1.2
Local alluvial land, wet		409	3,752		4,161	1.8
Lynchburg sandy loam, 0 to 2 percent slopes	80	25	141		246	.1
Magnolia sandy loam, 0 to 2 percent slopes	85			17	102	(1)
Magnolia sandy loam, 2 to 5 percent slopes, eroded	1,020	200		40	1,260	.5
Magnolia sandy loam, 5 to 8 percent slopes, eroded		60	340	30	430	.2
Mine pits and dumps					2,261	1.0
Norfolk loamy sand, 0 to 2 percent slopes	190			14	204	.1
Norfolk loamy sand, 2 to 5 percent slopes	2,382	216	1,491	48	4,137	1.8
Norfolk loamy sand, 2 to 5 percent slopes, eroded	2,635	361	1,804	145	4,945	2.1
Norfolk loamy sand, 5 to 8 percent slopes, eroded		122	1,485		1,607	.7
Norfolk loamy sand, thick surface, 2 to 5 percent slopes	1,467	137	1,708	289	3,601	1.5
Norfolk loamy sand, thick surface, 5 to 8 percent slopes		59	140		199	.1
Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded	120	216	1,058	72	1,466	.6
Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded	168	24	2,525	48	2,765	1.2
Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded			1,611		1,611	.7
Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded			310		310	.1
Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded			4,153		4,153	1.8
Orangeburg loamy sand, 0 to 2 percent slopes	380	57			437	.2
Orangeburg loamy sand, 2 to 5 percent slopes	770	409	1,202	289	2,670	1.1
Orangeburg loamy sand, 2 to 5 percent slopes, eroded	2,549	818	5,459	818	9,644	4.1
Orangeburg loamy sand, 5 to 8 percent slopes, eroded	1,034	409	7,672	409	9,524	4.1
Orangeburg loamy sand, 8 to 12 percent slopes, eroded	288	168	8,081	96	8,633	3.7
Orangeburg loamy sand, 12 to 17 percent slopes, eroded			5,671		5,671	2.4
Orangeburg loamy sand, thick surface, 2 to 5 percent slopes	794		794	169	1,757	.8
Orangeburg loamy sand, thick surface, 5 to 8 percent slopes			429		429	.2
Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded	361	240	3,102	48	3,751	1.6
Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded	48		4,209	216	4,473	1.9
Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded			2,213	72	2,285	1.0
Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded			7,648		7,648	3.3
Red Bay loamy sand, 0 to 2 percent slopes	335				335	.1
Red Bay loamy sand, 2 to 5 percent slopes	300	45			345	.1
Red Bay loamy sand, 2 to 5 percent slopes, eroded	350	95	166		611	.3
Red Bay loamy sand, 5 to 8 percent slopes, eroded			686		686	.3
Red Bay loamy sand, 8 to 12 percent slopes, eroded			212		212	.1
Ruston loamy sand, 2 to 5 percent slopes	400	100		29	529	.2
Ruston loamy sand, 2 to 5 percent slopes, eroded	820	210	75	25	1,130	.5
Ruston loamy sand, 5 to 8 percent slopes, eroded	120		361	24	505	.2
Ruston loamy sand, thick surface, 2 to 5 percent slopes	200		207		407	.2

[1] Less than 0.1 percent.

TABLE 4.—*Approximate acreage and proportionate extent of soils and use of soils at time of the survey*—Continued

Soils	Use				Total	
	Cultivated crops	Pasture	Forest	Idle	Area	Extent
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Percent*
Ruston loamy sand, thick surface, 5 to 8 percent slopes			278		278	0. 1
Sands over kaolinitic deposits			4, 629		4, 629	2. 0
Sandy and clayey land, gently sloping, eroded	625		7, 913		8, 538	3. 7
Sandy and clayey land, sloping, eroded			12, 209		12, 209	5. 2
Sandy and clayey land, strongly sloping, severely eroded			8, 586		8, 586	3. 7
Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded			205		205	. 1
Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded			2, 694		2, 694	1. 2
Susquehanna sandy loam, 2 to 8 percent slopes, eroded			4, 643		4, 643	2. 0
Susquehanna sandy loam, 8 to 17 percent slopes, eroded			3, 968		3, 968	1. 7
Swamp			4, 798		4, 798	2. 1
Tifton fine sandy loam, 2 to 5 percent slopes	1, 276	385	746	48	2, 455	1. 0
Tifton fine sandy loam, 2 to 5 percent slopes, eroded	2, 454	500	818	54	3, 826	1. 6
Tifton fine sandy loam, 5 to 8 percent slopes, eroded	288	72	168	72	600	. 3
Wahee loamy sand	55		175	240	470	. 2
Wahee loamy sand, thick surface	150	100	1, 060		1, 310	. 6
Wehadkee silty clay loam			270		270	. 1
Wet alluvial land			21, 324		21, 324	9. 1
Urban and Built-up					1, 034	. 4
Water areas					986	. 4
Total					233, 600	100. 0

This soil is suited to most crops grown locally, but yields are only fair because the moisture-supplying capacity is low and added minerals leach rapidly. To reduce the loss from rapid leaching, add fertilizer in split applications. (Capability unit IIIs–1; woodland suitability group 4.)

Binnsville Series

The Binnsville series consists of very shallow, moderately well drained, alkaline soils on uplands. These soils occur in small patches on very gently sloping or gently sloping ridgetops and side slopes. They developed in residuum from marl, chalk, or limestone.

These soils are associated with the Eutaw, Oktibbeha, and Susquehanna soils. Binnsville soils have a finer textured surface layer than the Susquehanna soils, which are strongly acid throughout the profile. Unlike the Oktibbeha soils, Binnsville soils lack a B horizon. They are better drained than the Eutaw soils.

In Twiggs County, Binnsville soils are in the southwestern part in the area called the Black Belt.

Because their root zone is shallow and erosion is a severe hazard, the Binnsville soils are not suited to cultivation. All of the acreage is wooded.

Binnsville clay, 2 to 8 percent slopes, eroded (BuB2).—This is an alkaline soil with a very shallow root zone. A brief description of a profile follows:

0 to 6 inches, dark-gray clay.
6 to 60 inches +, light-gray to brownish-yellow marl.

The surface layer ranges from 2 to 8 inches in thickness and, in some areas, is directly over a layer of partly disintegrated chalk or marl. Fragments of shale occur throughout the profile. Included with the mapped area of this soil are small areas of Eutaw, Oktibbeha, and Susquehanna soils.

This soil contains medium and large amounts or organic matter and is low to medium in natural fertility. Water moves into and through this soil slowly or very slowly, and runoff is rapid. The moisture-supplying capacity is low, and tilth is generally poor.

Because the root zone is shallow and erosion is likely, this soil is not suited to cultivated crops. If properly managed, the less eroded areas can produce fair pasture. All of the acreage is in trees. (Capability unit VI–3; woodland suitability group not assigned.)

Chewacla Series

In this series are friable, somewhat poorly drained or moderately well drained, level or nearly level soils on flood plains. These soils are in the western part of the county along the Ocmulgee River and are likely to be flooded periodically. Their parent material is recent alluvium that washed from soils of the Piedmont. They generally contain a medium or small amount of organic matter and are medium acid or strongly acid.

These soils are adjacent to the poorly drained Wehadkee soils in many places. If protected from overflow, Chewacla soils would be highly productive of crops and pasture. They are kept in trees, however, because they are flooded periodically.

Chewacla silt loam (Csl).—This is a somewhat poorly drained to moderately well drained, medium-textured soil on first bottoms. A brief description of the profile follows:

0 to 6 inches, reddish-brown, very friable silt loam.
6 to 16 inches, reddish-brown, friable silt loam.
16 to 26 inches +, mottled, gray silty clay.

Small mica flakes occur throughout the profile and are abundant in some profiles. The depth to mottling ranges from 10 to 20 inches and averages about 16 inches. In some places the underlying material is sand. Included with this soil are small areas of Wehadkee soils.

Chewacla silt loam contains a medium or small amount of organic matter and is medium acid or strongly acid. Surface runoff is very slow, and permeability is moderate in the surface layer and slow in the subsoil. The moisture-supplying capacity is high.

If protected against overflow from the river, this soil would be excellent for truck crops and pasture. It is now in trees. (Capability unit IIIw–3; woodland suitability group 3.)

Eustis Series

The Eustis series consists of deep to very deep, somewhat excessively drained soils that are sandy and dark yellowish brown to strong brown. These soils are on level to strongly sloping uplands. They developed from moderately thick beds of acid marine sands overlying finer sediments and are medium acid or strongly acid.

Eustis soils are associated with Lakeland, Americus, Ruston, and Orangeburg soils. They have a subsoil that is redder than that of the Lakeland soils and less red than that of the Americus. They are coarser textured throughout the profile than the Ruston and the Orangeburg soils and, unlike those soils, do not have a textural B horizon.

The Eustis soils are fairly well distributed throughout the county. Most of the acreage has been cultivated but now is idle or has grown up in pines and hardwoods.

Because they are droughty, sandy, and contain small amounts of plant nutrients and organic matter, these soils produce low yields of most crops grown locally (fig. 3).

Eustis loamy sand, shallow, 0 to 5 percent slopes (EsB).—This soil is droughty and very deep. A brief description of the profile follows:

0 to 23 inches, dark grayish-brown, loose loamy sand that is dark yellowish brown in the lower part.
23 to 40 inches, strong-brown loamy sand.
40 to 72 inches +, yellowish-red sandy loam to sandy clay loam.

Included with this soil are areas that have a sand surface layer. Also included are small areas of Lakeland, Ruston, and Americus soils.

Figure 3.—**Corn, sweetpotatoes, and peppers on Eustis sand, 5 to 8 percent slopes. This soil is better suited to pasture and hay than to crops. Class IV land.**

This soil contains little organic matter, is low in natural fertility, and is medium acid or strongly acid. Water moves into and through this soil rapidly or very rapidly, and the moisture-supplying capacity is low.

Most crops commonly grown in the area are suited to this soil, but yields are only fair because the soil is droughty and sandy. (Capability unit IIIs–1; woodland suitability group 4.)

Eustis loamy sand, shallow, 5 to 8 percent slopes (EsC).—Because it is more strongly sloping and has more rapid runoff than Eustis loamy sand, shallow, 0 to 5 percent slopes, this soil is more susceptible to erosion. It contains a small amount of organic matter and is low in productivity. Water moves into and through this soil rapidly, and the moisture-supplying capacity is low.

This soil can be cultivated occasionally, but it is generally best suited to pasture and hay. Most of it is wooded, but a few small, scattered areas are cultivated or idle. Some woodlots have been planted to pines. (Capability unit IVs–1; woodland suitability group 4.)

Eustis sand, 2 to 5 percent slopes (ErB).—This soil is coarser textured throughout the profile and more permeable than Eustis loamy sand, shallow, 0 to 5 percent slopes. It has faster infiltration, lower moisture-supplying capacity, and more excessive internal and external drainage. Crop yields generally are less.

Most of this soil is idle or has grown up in pines and hardwoods. It can be planted to cultivated crops occasionally, but it is better suited to pasture or hay. (Capability unit IVs–1; woodland suitability group 5.)

Eustis sand, 5 to 8 percent slopes (ErC).—This soil is more sandy throughout the profile than Eustis loamy sand, shallow, 0 to 5 percent slopes. It takes in and transmits water more rapidly than the loamy sand, is lower in moisture supplying capacity, and yields less.

Only small patches of this soil are farmed. Most of it is idle or has grown up in hardwoods and pines. It is better suited to pasture or hay than to cultivated crops. Pines have been planted in some areas. (Capability unit IVs–1; woodland suitability group 5.)

Eustis sand, 8 to 12 percent slopes (ErD).—This strongly sloping soil is more sandy and more droughty than Eustis loamy sand, shallow, 0 to 5 percent slopes. It is best suited to pine trees but can be used for pasture. (Capability unit VIs–1; woodland suitability group 5.)

Eustis sand, terrace (0 to 2 percent slopes) (Eus).—This nearly level soil is deep to very deep and is somewhat excessively drained. It is on terraces of the Ocmulgee River along the western boundary of the county. In most places brown to reddish-brown sand extends from the surface to a depth of more than 3 feet. This sand resembles the Eustis sand of upland areas but has been laid down more recently. In some places fine-textured sediments are at a depth of less than 3 feet.

This soil contains little organic matter and is low in natural fertility. It supplies only a small amount of water to plants and is droughty in summer. Tillage is easy. All of the acreage is wooded. (Capability unit IVs–1; woodland suitability group 5.)

Eutaw Series

The Eutaw series consists of somewhat poorly drained, gently sloping to strongly sloping soils on uplands. In

this county Eutaw soils occur in intricate patterns with Oktibbeha and Susquehanna soils and are mapped only in complexes with those soils.

Eutaw soils developed in beds of clay, less than 4 feet deep to marl, chalk, or limestone. Their surface layer is sandy loam to clay loam, 2 to 4 inches thick. The subsoil is gray, heavy, plastic clay faintly mottled with light gray, yellow, and red.

Eutaw soils are not so well drained as the Oktibbeha soils, and they do not have a reddish subsoil. They have an acid surface layer and an alkaline subsoil, whereas Binnsville soils have an alkaline surface layer and Susquehanna soils are acid throughout. The soil complexes containing Eutaw soils occur in the southwestern part of the county in the Black Belt. Because of a shallow root zone, poor tilth, poor drainage, and low moisture-supplying capacity, Eutaw soils are not well suited to cultivated crops. All the acreage is in trees.

Faceville Series

The Faceville series consists of deep, friable, well-drained soils that are on gently sloping to strongly sloping uplands. These soils developed in beds of sandy loam and sandy clay. They are medium acid or strongly acid, and they contain a medium or small amount of organic matter.

The Faceville soils are associated with Greenville, Magnolia, Norfolk, and Ruston soils. They are more shallow than Greenville and Magnolia soils and have a brownish instead of a reddish subsoil. They have a finer textured subsoil and a thinner surface layer than Norfolk and Ruston soils.

Faceville soils are suited to many crops. They are inextensive and are used mainly for cultivated crops and pasture.

Faceville fine sandy loam, 2 to 5 percent slopes, eroded (FoB2).—This is a deep, well-drained soil on uplands. A brief description of a profile follows:

0 to 9 inches, very dark grayish-brown, very friable fine sandy loam that grades to dark yellowish-brown sandy loam in the lower part.
9 to 52 inches, strong-brown, friable sandy clay loam, 6 to 8 inches thick, over firm, blocky sandy clay.
52 to 60 inches +, strong-brown, extremely firm sandy clay mottled with red, yellowish brown, and pale gray.

Small areas of sandy loam and loamy fine sand are included. A few small areas have a reddish sandy clay loam or clay loam subsoil.

This soil contains a medium or small amount of organic matter and is medium acid or strongly acid. Water moves into and through the soil rapidly, and the moisture-supplying capacity is moderate.

This soil is well suited to most crops commonly grown in the area. Tillage is easy, but the erosion hazard is slight to moderate. Cotton, corn, peanuts, small grains, and soybeans are the main crops. Pasture is a good use. (Capability unit IIe–2; woodland suitability group 1.)

Faceville fine sandy loam, 5 to 8 percent slopes, eroded (FoC2).—This strongly sloping soil has more rapid surface runoff than Faceville fine sandy loam, 2 to 5 percent slopes, eroded, and is more likely to erode. If intensively managed it can be safely cultivated, and it produces good crop yields. Pasture is a good use. Suitable plants are common bermudagrass, Coastal bermudagrass, and bahiagrass. (Capability unit IIIe–2; woodland suitability group 1.)

Grady Series

The Grady series consists of deep, poorly drained soils in low, saucerlike depressions and sinks. These soils developed in thin beds of acid sandy loam and clay.

Grady soils occur with the Lynchburg, Norfolk, Tifton, Greenville, and Magnolia soils but are not so well drained as those soils. They have a finer textured subsoil than the Lynchburg soils and have more organic matter in the surface layer than the Norfolk, Tifton, Greenville, and Magnolia soils.

These soils occupy a small total acreage that is fairly well distributed throughout the county. Because they are poorly drained, they are not well suited to cultivated crops. Most of the acreage is in trees.

Grady sandy loam (0 to 2 percent slopes) (Gra).—This is a poorly drained soil in depressions and sinks. A brief description of a profile follows:

0 to 6 inches, very dark gray sandy loam.
6 to 14 inches, grayish-brown, friable sandy clay loam.
14 to 26 inches, gray, firm sandy clay with blocky structure.
26 to 36 inches +, mottled, gray sandy clay or clay.

Some areas are included that have a fine sandy loam surface layer. Also included are areas with a darker surface layer than that described.

This soil contains a medium amount of organic matter, and the supply is more plentiful at the center of the depressions than at the rim. It is strongly acid and medium to low in natural fertility. Erosion is not a problem, because in most places, soil material is brought in from surrounding higher soils. Infiltration and permeability are slow to very slow, and the moisture-supplying capacity is moderate to high. Water commonly ponds in long wet periods, because this soil is in depressions or sinks and the only outlet for the water is underground. If it is drained, this soil can be used for truck crops. But very little of this soil is drained, because it is in small areas and the cost of drainage is high. It is used mainly for forest, though a few acres are in pasture. (Capability unit IIIw–2; woodland suitability group 3.)

Greenville Series

The Greenville series consists of deep, friable, well-drained soils that are on nearly level to steep uplands. These soils developed in sandy clay loam and sandy clay that, in many places, overlie siliceous limestone. Their uniform dark-red color generally extends to a depth of more than 10 feet.

Greenville soils occur with the Magnolia, Red Bay, Faceville, and Americus soils. They have a darker surface layer than Magnolia soils and are finer textured in the subsoil than the Red Bay soils. The subsoil of Greenville soils is dark red, whereas that of the Faceville soils is strong brown or yellowish brown. Greenville soils have a thinner A horizon than have the Americus soils and are finer textured throughout the profile.

In Twiggs County these soils occur in the southwestern part. Gently sloping areas are well suited to culti-

vated crops, but the steeper areas are best suited to trees. Most of the acreage is in trees.

Greenville sandy loam, 2 to 5 percent slopes (GoB).—This is a deep, well-drained, friable soil on uplands. A brief description of a profile follows:

0 to 7 inches, dark reddish-brown sandy loam.
7 to 21 inches, dark reddish-brown, friable sandy clay loam with blocky structure.
21 to 72 inches +, dark-red sandy clay with blocky structure.

The surface layer ranges from 5 to 12 inches in thickness. Small areas of Magnolia, Red Bay, and Faceville soils are included. Also included are small areas that have a loamy sand surface layer and some eroded spots that have a clay loam surface layer.

This soil contains a small or medium amount of organic matter. It has moderate fertility and is medium acid or strongly acid. Water moves into and through the soil at a moderately rapid rate, and the moisture-supplying capacity is moderate.

This soil is productive and is easily tilled. It is well suited to most crops commonly grown in this area. The main crops are cotton, corn, peanuts, small grains, soybeans, and truck crops. This soil also is well suited to permanent pasture or hay. In cultivated areas the erosion hazard is slight to moderate. Most of the acreage is in cultivated crops. (Capability unit IIe–2; woodland suitability group 1.)

Greenville sandy loam, 0 to 2 percent slopes (GoA).—This gently sloping soil has slower surface runoff than Greenville sandy loam, 2 to 5 percent slopes, and is less likely to erode. It is well suited to most crops grown locally. If adequately fertilized, limed, and otherwise well managed, it can produce large yields. Included with this soil are small areas west of Huber that are similar but are on stream terraces rather than uplands. (Capability unit I–2; woodland suitability group 1.)

Greenville sandy loam, 2 to 5 percent slopes, eroded (GoB2).—This eroded, sloping soil has more rapid surface runoff than Greenville sandy loam, 0 to 2 percent slopes, and a thinner surface layer. Water enters this soil more slowly, and tilth generally is not so good. In most places subsoil material is mixed with the surface layer. Included with this soil are a few severely eroded areas that have a clay loam surface layer.

This soil can be cultivated if moderate practices are used to control erosion. If adequately limed, fertilized, and otherwise appropriately managed, it can produce good yields. (Capability unit IIe–2; woodland suitability group 1.)

Greenville sandy loam, 5 to 8 percent slopes, eroded (GoC2).—The plow layer of this strongly sloping, eroded soil is a mixture of the original surface soil and the subsoil. Surface runoff is more rapid than on Greenville sandy loam, 2 to 5 percent slopes, and further erosion is more likely. Tilth generally is not so good, and water enters the soil more slowly.

Included with this soil are a few small, severely eroded areas that have a clay loam surface layer. Also included, on stream terraces west of Huber, are small areas of a soil similar except for its position.

All of this soil is wooded. If it were cleared and intensively managed to control erosion, it could be cultivated; but it generally is better suited to pasture or hay than to tilled crops. (Capability unit IIIe–2; woodland suitability group 1.)

Greenville sandy loam, 8 to 12 percent slopes, eroded (GoD2).—In many places the plow layer of this strongly sloping, eroded soil is a mixture of the original surface soil and the subsoil. Surface runoff is much more rapid on this soil than on Greenville sandy loam, 2 to 5 percent slopes, and the erosion hazard is much greater. Tilth generally is not so good, and water enters the soil more slowly.

All of this soil is wooded. If it were cleared and intensively managed to control erosion, it could be cultivated occasionally, but generally it is better suited to permanent vegetation than to cultivated crops. (Capability unit IVe–2; woodland suitability group 1.)

Greenville clay loam, 8 to 12 percent slopes, severely eroded (GpD3).—The plow layer of this severely eroded soil consists of remnants of the original surface layer mixed with material from the subsoil. The soil has a finer textured, redder plow layer than has Greenville sandy loam, 2 to 5 percent slopes. Because it is steeper than that soil and has more rapid surface runoff, it is more likely to erode. Infiltration is slower, and the moisture-supplying capacity and fertility are lower. All this soil is wooded and is best suited to that use, but it could be used for permanent pasture if it were cleared. (Capability unit VIe–1; woodland suitability group 1.)

Greenville clay loam, 12 to 17 percent slopes, severely eroded (GpE3).—This moderately steep soil has a finer textured, redder plow layer than Greenville sandy loam, 2 to 5 percent slopes. The plow layer consists of remnants of the original surface soil mixed with the upper part of the subsoil. There are a few shallow gullies and an occasional deep one.

Surface runoff is much more rapid on this soil than on Greenville sandy loam, 2 to 5 percent slopes. Infiltration is slower, the moisture-supplying capacity is lower, and the organic-matter content is less. Especially in wet weather, this soil is generally in poor tilth. It is best suited to trees but can be seeded to pasture and occasionally grazed. (Capability unit VIIe–1; woodland suitability group 1.)

Greenville clay loam, 17 to 30 percent slopes, severely eroded (GpF3).—The surface layer of this steep soil is finer textured than that of Greenville sandy loam, 2 to 5 percent slopes. The original surface soil has almost entirely washed away, and subsoil material is exposed or is mixed with remnants of the surface soil. Many small gullies and an occasional deep one have formed.

This soil has slower infiltration than the gently sloping sandy loam, and lower moisture-supplying capacity. It is best suited to trees or to some other kind of permanent vegetation. (Capability unit VIIe–1; woodland suitability group 1.)

Gullied Land

This land is an intricate network of large and small, deep and very deep gullies that are interspersed with remnants of soil. It is not suited to crops or pasture but may be used for recreation or for wildlife habitats. Some areas can be reforested.

Gullied land (Gul).—This land type consists of areas so severely eroded that they are difficult to reclaim for crops or pasture. It is distributed throughout the northern and central parts of the county. Some areas smaller than 3 acres are shown on the soil map by the symbol for gullies.

Areas larger than 3 acres are delineated; most of them are 3 to 8 acres in size. The soil material is sandy, and the original soils were probably Red Bay and Orangeburg soils.

Some areas have been seeded to kudzu, and some have reforested naturally. All areas should be kept in vegetation to prevent excess runoff and the silting of streams and lakes. Any kind of vegetation is satisfactory, but trees should be planted where practical. (Capability unit VIIe–3; not rated for woodland suitability.)

Izagora Series

The Izagora series consists of deep, moderately well drained, medium-textured soils on stream terraces. These nearly level soils occur on the second bottoms and terraces along streams. They developed in old alluvium that washed from the Coastal Plain.

These soils are associated with the Wahee soils but are better drained than those soils and have a coarser B horizon.

In this county Izagora soils occur along the Ocmulgee River. Their native vegetation was mixed hardwoods and pine. Because they are low lying and have a high water table, they are only moderately well suited to cultivated crops. Most of the acreage is in trees or is idle.

Izagora sandy loam (0 to 2 percent slopes) (Iza).—This is a moderately well drained soil on stream terraces. A brief description of a profile follows:

0 to 10 inches, sandy loam that is pale brown in the upper part and grades to yellowish brown in the lower.
10 to 30 inches, yellowish-brown, friable, blocky sandy clay loam mottled with red.
30 to 40 inches +, mottled, yellowish-brown sandy clay.

The surface layer ranges from 6 to 10 inches in thickness. Some areas that have a loamy sand surface layer are included.

Izagora sandy loam contains a medium or small amount of organic matter, is moderate in fertility, and is strongly acid. It has a thick root zone and is generally in good tilth. The moisture-supplying capacity is moderate.

This soil produces high yields of many kinds of crops under good management. Most of the acreage has been used for cotton or corn, but much of it now is in trees. (Capability unit IIw–2; woodland suitability group 2.)

Lakeland Series

The Lakeland series consists of very deep, somewhat excessively drained, level to strongly sloping soils on uplands. These soils are in thick beds of sand that overlie finer sediments in places. No B horizon has developed.

Lakeland soils occur with Eustis, Norfolk, and Ruston soils. They are similar to the Eustis soils in texture but are light olive gray instead of brown or reddish brown. They are coarser throughout the profile than are the Norfolk and the Ruston soils. The Norfolk and the Ruston soils have a textural B horizon.

In this county Lakeland soils occur in the northern and southeastern parts. Because they are droughty and leach rapidly, they are not well suited to cultivated crops. Most of the acreage is wooded.

Lakeland sands, 0 to 5 percent slopes (LpB).—This is a very deep, somewhat excessively drained soil on uplands. A brief description of a profile follows:

0 to 6 inches, light olive-gray sand.
6 to 22 inches, very pale brown sand.
22 to 60 inches+, pale-brown sand.

The surface layer ranges from 2 to 10 inches in thickness and, in places, is somewhat darker than that in the profile described. Small areas of Eustis and Norfolk soils are included.

These soils contain little organic matter and are low in natural fertility. Water moves into and through the profile very rapidly, and the moisture-supplying capacity is low. Tilth is generally good.

Because these soils are droughty, crop yields are only fair, especially during dry seasons. Most of the acreage is wooded, but a small part is in cultivated crops or in pasture. (Capability unit IVs–1; woodland suitability group 5.)

Lakeland sands, 5 to 8 percent slopes (LpC).—These strongly sloping soils have more rapid surface runoff than Lakeland sands, 0 to 5 percent slopes, and are more likely to erode. But the erosion hazard is small, because water moves very rapidly through the sandy profile and all of the acreage is wooded. If these soils were cleared, they could be cultivated occasionally but would be best suited to pasture. (Capability unit IVs–1; woodland suitability group 5.)

Lakeland sands, 8 to 12 percent slopes (LpD).—These strongly sloping soils have more rapid surface runoff than Lakeland sands, 0 to 5 percent slopes, and are more likely to erode. But the erosion hazard is slight, because water moves very rapidly through the profile and all of the acreage is wooded. These soils are too droughty for cultivated crops, but they could be seeded to permanent pasture if they were cleared. Their best use, however, is for trees. (Capability unit VIs–1; woodland suitability group 5.)

Lakeland loamy sands, shallow, 2 to 5 percent slopes (LoB).—These soils are more shallow than Lakeland sands, 0 to 5 percent slopes, and are finer textured throughout the profile. Their surface layer is underlain by sandy material, and the sandy material is underlain by a finer textured layer at a depth of 30 to 42 inches. Infiltration and permeability are not so rapid as they are in the sandier soils, and the moisture-supplying capacity is not so low.

These soils are generally in good tilth and are not likely to erode. They contain a small amount of organic matter and are low in natural fertility. About one-third of the acreage is cultivated, and the rest is wooded or is idle. (Capability unit IIIs–1; woodland suitability group 4.)

Lakeland loamy sands, shallow, 5 to 8 percent slopes (LoC).—These strongly sloping soils are more shallow and finer textured throughout the profile than are Lakeland sands, 0 to 5 percent slopes. Their surface layer is underlain by sandy material, and the sandy material is underlain by a finer textured layer at a depth of 30 to 42 inches. Tilth is generally good, and erosion is not likely. Some areas, however, have excessive runoff and are gullied.

These soils are low in moisture-supplying capacity and in natural fertility. They contain a small amount of organic matter. Water enters these soils and moves through the profile rapidly. These soils respond fairly well to good management, but yields are only fair. All of the acreage is wooded. (Capability unit IVs–1; woodland suitability group 4.)

Lakeland sand, terrace (Lak).—This is a somewhat excessively drained soil, 3 to 4 feet thick, on stream terraces of the Ocmulgee River. It is droughty, loose, and yellowish brown. Although it is similar to the Lakeland sands on the adjacent uplands, Lakeland sand, terrace, is younger. Slopes range from 0 to 3 percent.

Small areas of lower lying sandy soils are included. Also included are a few small areas of soil less than 3 feet thick over fine sediments.

This soil is low in fertility and contains a small amount of organic matter. It is easy to till but produces only fair crop yields. All the acreage is wooded and is best suited to that use. (Capability unit IVs–1; woodland suitability group 5.)

Local Alluvial Land

This land type consists of material brought in from adjacent uplands. The material has accumulated in stream beds, draws, and depressions throughout the county.

Local alluvial land (Lcm).—This land is made up of mixed material that has washed, rolled, or sloughed from adjacent uplands. It is moderately well drained and occurs in natural depressions, draws, and shallow drainageways. Although it floods periodically, this land dries out rapidly and crops are seldom damaged. Slope ranges from 0 to 5 percent. Erosion is not a problem.

The color, texture, and consistency of this land varies according to those characteristics in the adjacent soils. The thickness of the profile depends on the amount of material accumulated. In most places the surface layer is dark-gray to reddish-brown loamy sand to sandy loam, and it is about 30 inches thick over red or yellow sandy clay or sandy clay loam.

Local alluvial land is well suited to most crops grown locally. Generally, it is planted to the same kinds of crops as are soils on the adjacent uplands. Although this land makes up only about 1 percent of the county, it is important agriculturally. Areas in suitable positions may be used as vegetated waterways to carry away excess water from furrows and terrace outlets. (Capability unit IIw–1; woodland suitability group 2.)

Local alluvial land, wet (Lcn).—This land occurs in drainageways, small stream beds, and ponded areas. It consists of wet, stratified material washed from adjacent uplands. Parts of plants are buried in this material. Because it has a high water table and, in many places, receives seepage from higher soils, this land is wet most of the time. Generally, the surface layer is dark gray and is underlain by a layer streaked and splotched with brown, red, and gray.

This land is generally low in fertility but high in moisture-supplying capacity. The natural vegetation consists of gums, cypress, water oaks, pond pine, and slash pine; the understory is brush. If drained and otherwise well managed, this land can be used for pasture. (Capability unit Vw–2; woodland suitability group 3.)

Lynchburg Series

The Lynchburg series consists of deep, somewhat poorly drained, nearly level soils on uplands. These soils developed in beds of sandy loam, loamy sand, and sandy clay. Their surface layer is dark-gray to gray sandy loam. The subsoil is light yellowish-brown sandy clay loam, mottled with pale yellow, light gray and yellowish red.

Lynchburg soils occur with Grady, Lakeland, Norfolk, and Tifton soils. They are better drained than the Grady soils and are not so sandy as the Lakeland soils. They are more poorly drained than the Lakeland, Norfolk, and Tifton soils.

These soils have a small total acreage in Twiggs County and are in the southeastern part. Their native vegetation is pine, oak, hickory, sweetgum, and gallberry. Most of the acreage is in trees, but a large part is in pasture and hay. If adequately drained, Lynchburg soils are suited to many kinds of cultivated crops.

Lynchburg sandy loam, 0 to 2 percent slopes (LtA).—This is a deep, somewhat poorly drained, strongly acid soil on uplands. A brief description of a profile follows:

0 to 18 inches, dark-gray to gray sandy loam over pale-yellow loamy sand.
18 to 32 inches, mottled, light yellowish-brown to pale-yellow sandy clay loam with blocky structure.
32 to 40 inches, highly mottled, light-gray sandy clay loam.

Small areas of Lakeland and Norfolk soils and Local alluvial land, wet, are included. Also included are small areas that have a loamy fine sand surface layer.

This soil contains a medium to small amount of organic matter and is low in natural fertility. It is strongly acid. Water moves rapidly into and through the upper part of the profile but moves slowly in the lower part because the water table is high. The moisture-supplying capacity is moderate. This soil is easily tilled and is not likely to erode.

If adequately drained, this soil is suited to most crops generally grown in this area; it is especially suited to corn. More than one-half of the acreage is wooded. (Capability unit IIw–2; wooded suitability group 2.)

Magnolia Series

The Magnolia series consists of deep, well-drained, level to sloping soils on uplands. These soils developed in thick beds of acid sandy clay and clay. Their surface layer is grayish-brown to yellowish-red sandy loam. The subsoil is red to dark-red sandy clay.

Magnolia soils are associated with Greenville, Faceville, Orangeburg, and Red Bay soils. They have a lighter colored surface layer than the Greenville soils and a more reddish subsoil than the Faceville soils. Their subsoil is finer textured than that of the Orangeburg and Red Bay soils.

The total acreage of Magnolia soils in Twiggs County is small, but these soils are important agriculturally. They are well suited to most cultivated crops grown locally. Most of the acreage is cultivated.

Magnolia sandy loam, 2 to 5 percent slopes, eroded (MxB2).—This is a deep, well-drained soil on uplands. A brief description of a profile follows:

0 to 9 inches, sandy loam, grayish brown in the upper part and yellowish red in the lower.

9 to 50 inches, red to dark-red, firm sandy clay with blocky structure.
50 to 60 inches, dark-red sandy clay with a few, distinct mottles of strong brown and light yellowish brown.

Small areas of Greenville, Orangeburg, and Eustis soils are included with this soil.

This strongly acid soil contains a small amount of organic matter and is moderate in fertility. Infiltration is moderately rapid, and permeability is moderate to moderately slow. The moisture-supplying capacity is moderate. Tilth is good.

This soil is well suited to most crops commonly grown in the area. Erosion is a slight to moderate hazard in cultivated areas. All of the acreage is in cultivated crops or in pasture. (Capability unit IIe–2; woodland suitability group 1.)

Magnolia sandy loam, 0 to 2 percent slopes (MxA).—This nearly level soil has slower surface runoff than Magnolia sandy loam, 2 to 5 percent slopes, eroded, and has a thicker surface layer. It is well suited to most crops grown locally. If limed, fertilized, and otherwise well managed, this soil produces large yields. Most of the small total acreage is in cultivated crops. (Capability unit I–2; woodland suitability group 1.)

Magnolia sandy loam, 5 to 8 percent slopes, eroded (MxC2).—This strongly sloping soil has more rapid surface runoff than Magnolia sandy loam, 2 to 5 percent slopes, eroded, and is more susceptible to erosion. It has slower infiltration and generally poor tilth. If intensively managed this soil can be cultivated, but it is better suited to pasture or hay than to crops. Most of the acreage is wooded, a small part is in pasture, and a few fields are idle. (Capability unit IIIe–2; woodland suitability group 1.)

Mine Pits and Dumps

This land type consists of kaolin strip mines and spoil material from the excavations.

Mine pits and dumps (Mpd).—The kaolin mines and the spoil that make up this land type occupy about 1 percent of the county and are in the northern part. Some of the pits are 100 feet deep or more. The spoil material has been piled in high mounds or has been spread over large areas. These areas cannot be cultivated, but they may support some trees. Some of the abandoned mines are filled with water and can be stocked with fish. Mine pits and dumps have not been assigned a capability unit or a woodland suitability group.

Norfolk Series

The Norfolk series consists of deep, friable, well-drained soils on nearly level to moderately steep uplands. These soils developed from thick beds of acid sandy loam, sandy clay loam, and sandy clay. They are medium acid to strongly acid.

The Norfolk soils are associated with the Tifton, Ruston, Faceville, and Lakeland soils. They are coarser textured in the subsoil than Tifton soils, and iron concretions have not accumulated in them as they have in Tifton soils. Their subsoil is not so red as that in Ruston soils, and is not so fine textured as that in Faceville soils. Norfolk soils are finer textured throughout the profile than Lakeland soils.

In Twiggs County Norfolk soils are in the southeastern part. They make up about 9 percent of the county. The native vegetation was chiefly pine, oak, hickory, dogwood, and shrubs, but now many of the more gently sloping areas are cultivated. These areas are well suited to most crops commonly grown in this county and respond well to management.

Norfolk loamy sand, 2 to 5 percent slopes (NhB).—A brief description of this deep, friable, well-drained soil on uplands follows:

0 to 11 inches, loamy sand that is dark grayish brown in the upper part and yellowish-brown light sandy loam in the lower.
11 to 40 inches, sandy clay loam that is yellowish brown and friable in the upper part and strong brown and firm in the lower.
40 to 50 inches +, brownish-yellow sandy clay loam with many, reddish-yellow, red, and gray mottles.

Included with this soil are areas that have a sandy loam surface layer. A few small areas have a brownish-yellow to yellow, firm sandy clay subsoil. Also included are small areas of Tifton and Lakeland soils.

This soil is moderate to low in natural fertility. It contains a medium to small amount of organic matter and is medium acid or strongly acid. Water enters and moves through this soil rapidly, and the moisture-supplying capacity is moderate.

This soil has a thick root zone and generally is in good tilth. It is well suited to many kinds of crops, but the erosion hazard is slight to moderate if the soil is cultivated. If adequately fertilized, limed, and otherwise well managed, it produces large yields. Slightly more than half of this extensive soil is cultivated. (Capability unit IIe–1; woodland suitability group 1.)

Norfolk loamy sand, 0 to 2 percent slopes (NhA).—This nearly level soil has slower surface runoff than Norfolk loamy sand, 2 to 5 percent slopes, and is not susceptible to erosion. It is well suited to many kinds of crops. If properly managed, this soil produces large yields. All of the small total acreage is in cultivated crops. (Capability unit I–1; woodland suitability group 1.)

Norfolk loamy sand, 2 to 5 percent slopes, eroded (NhB2).—This eroded soil has a thinner surface layer and a slower rate of infiltration than Norfolk loamy sand, 2 to 5 percent slopes, as well as a lower capacity for supplying moisture. Also, its content of organic matter is smaller than that in the uneroded soil, and tilth generally is not so good. The hazard of further erosion is slight to moderate.

If adequately limed, fertilized, and otherwise well managed, this soil produces good yields. Cotton, corn, peanuts, and forage plants are the main crops. More than half of the fairly extensive acreage is cultivated. (Capability unit IIe–1; woodland suitability group 1.)

Norfolk loamy sand, 5 to 8 percent slopes, eroded (NhC2).—Because it has stronger slopes and more rapid surface runoff than Norfolk loamy sand, 2 to 5 percent slopes, this soil is more eroded and, therefore, has a thinner surface layer. It also has slower infiltration and lower moisture-supplying capacity. The hazard of further erosion is moderate to severe.

This soil generally is better suited to pasture or hay than to tilled crops, but it can be cultivated if it is intensively managed. Most of the acreage is wooded, some small areas

are in pasture, and a few fields are idle. (Capability unit IIIe–1; woodland suitability group 1.)

Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded (NiB2).—A brief description of this well-drained, medium acid to strongly acid soil on uplands follows:

0 to 10 inches, pale-brown to yellowish-brown loamy sand.
10 to 30 inches, strong-brown to brownish-yellow, friable sandy clay loam with blocky structure.
30 to 36 inches +, mottled yellowish-red sandy loam.

In places the surface layer is dark gray. The profile contains small concretions of iron in some places. A few small areas of Lakeland soils are included. Also included are areas that have a sand surface layer.

This soil is low in natural fertility and contains a small amount of organic matter. It is medium acid to strongly acid. A moderate amount of moisture is available to plants. Water infiltrates and moves through the soil rapidly, and tilth is generally good.

This soil responds well to management and is suited to a wide variety of crops. Cultivated fields are slightly to moderately susceptible to erosion. Most of the acreage has been planted to cotton and corn, but now much of it is in hardwoods and pine. (Capability unit IIe–1; woodland suitability group 1.)

Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded (NiC2).—This strongly sloping, eroded soil has more rapid surface runoff than Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded, and has a thinner surface layer. The rate of infiltration is slower, and tilth is poorer.

Most of this soil is in trees. If it is intensively managed, it can be cultivated; but it is better suited to pasture and hay than to tilled crops. (Capability unit IIIe–1; woodland suitability group 1.)

Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded (NiD2).—This moderately steep, eroded soil has more rapid surface runoff than Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded, and is more susceptible to further erosion. It is low in organic matter, in natural fertility, and in capacity for supplying moisture.

All of this soil is wooded. Because it is steep and droughty, it is not suited to cultivated crops. It could be planted to tilled crops occasionally or seeded to pasture and hay, but it is best suited to trees. (Capability unit IVe–1; woodland suitability group 1.)

Norfolk loamy sand, thick surface, 2 to 5 percent slopes (NfB).—Although this soil has a thicker surface layer than Norfolk loamy sand, 0 to 2 percent slopes, it holds less available moisture and plant nutrients, and it contains less organic matter. The surface layer is 18 to 30 inches thick. Water moves into and through the soil more rapidly than in the thinner Norfolk soils.

This soil is somewhat droughty but is suited to many kinds of crops. About one-half of the small total acreage is in cultivated crops. (Capability unit IIs–1; woodland suitability group 1.)

Norfolk loamy sand, thick surface, 5 to 8 percent slopes (NfC).—This sloping soil has a thicker and more sandy surface layer than Norfolk loamy sand, 2 to 5 percent slopes, and has more rapid surface runoff. The surface layer is more than 18 inches thick. It is more susceptible to erosion. Infiltration and permeability are more rapid in the thick surface layer, and the moisture-holding capacity is lower. Fertility is lower, and the content of organic matter is less.

Generally, this soil is best suited to pasture, but it can be cultivated. Yields are low. Most of the small total acreage is wooded, but some small areas are in pasture. (Capability unit IIIe–5; woodland suitability group 1.)

Oktibbeha Series

The Oktibbeha series consists of moderately well drained, gently sloping to strongly sloping soils on uplands. These soils developed in beds of clay less than 4 feet deep to marl, chalk, or limestone. Their surface layer is dark-brown to reddish-brown fine sandy loam and is 2 to 4 inches thick. The subsoil is reddish-brown to red heavy clay, which is plastic when wet.

Oktibbeha soils are associated with the Eutaw, Susquehanna, and Binnsville soils. They are better drained and redder than the Eutaw and the Susquehanna soils and, unlike those soils, have a developed B horizon. Oktibbeha soils are alkaline in the subsoil in contrast to the Susquehanna soils, which are acid throughout. They do not have an alkaline surface layer like that in the Binnsville soils.

In this county Oktibbeha soils occur in intricate patterns with Eutaw and Susquehanna soils in the southwestern part of the county in the Black Belt. They are not mapped as single soils but are mapped only in two complexes with the Eutaw and Susquehanna soils. Oktibbeha soils are not well suited to cultivated crops. All the acreage in this county is in trees.

Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded (OfB2).—This soil complex consists of moderately well drained to poorly drained soils on uplands. These soils occur together in the southwestern part of the county and are in such intricate patterns that it is not practical to separate them on the soil map.

The Oktibbeha soils are moderately well drained and have a reddish-brown to red clay subsoil. The Eutaw soils are poorly drained and have a gray clay subsoil. Oktibbeha and Eutaw soils are acid in the upper part of their profile but are underlain, at a depth of 20 to 40 inches, by white, calcareous clay. The Susquehanna soils are somewhat poorly drained, strongly acid soils that have a mottled, gray clay subsoil. The Oktibbeha soils make up about 40 percent of the complex; Eutaw soils, about 35 percent; and the Susquehanna soils, about 25 percent.

A profile of a Susquehanna soil is described for the Susquehanna series. Profile descriptions of the Oktibbeha soil and of the Eutaw soil follow:

Oktibbeha fine sandy loam:

0 to 4 inches, dark reddish-brown fine sandy loam.
4 to 20 inches, reddish-brown, extremely firm clay; blocky structure.
20 to 50 inches +, light-gray clay grading to white, calcareous clay at a depth of about 40 inches.

The surface layer ranges from dark brown to reddish brown in color and from fine sandy loam to clay loam in texture. The subsoil is reddish brown to red.

Eutaw fine sandy loam:

0 to 4 inches, black fine sandy loam.
4 to 24 inches, gray, extremely firm clay with blocky structure.
24 to 40 inches +, white, calcareous clay mottled with pale yellow.

The surface layer ranges from fine sandy loam to clay loam. In the more eroded areas the clay subsoil is at the surface.

Because the soils in this complex have rapid surface runoff, erosion is a severe hazard. Infiltration and permeability are very slow, and the moisture-supplying capacity is low. The amount of organic matter is medium or small, and natural fertility is low. The tilth of these soils is generally poor, and the root zone is thin. In wet weather these soils are very sticky and they swell. They are extremely hard in dry weather and tend to crack and shrink. These soils can be cultivated occasionally, but it is better to keep them in pasture or trees. All of the small total acreage is in trees. (Capability unit IVe–4; woodland suitability group not assigned.)

Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded (OfD2).—Because slopes are stronger and surface runoff is more rapid on this soil complex than on Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded, erosion is a greater hazard. In some areas many shallow gullies and a few deep ones have formed. The soils in this complex have a low moisture-supplying capacity and a thin root zone.

These soils are not suited to cultivated crops. They are best suited to pasture or as woodland. All of the fairly large acreage is in trees. (Capability unit VIe–2; woodland suitability group not assigned.)

Orangeburg Series

The Orangeburg series consists of deep, well-drained, friable soils on uplands. These soils are nearly level to steep and are medium acid to strongly acid. They developed in thick beds of acid sandy loam and sandy clay loam that, in a few places, contained layers of finer or coarser sediments.

The Orangeburg soils are associated with Red Bay, Ruston, Magnolia, and Americus soils. They are lighter colored in the surface layer than the Red Bay soils. Their subsoil is red to dark red instead of yellowish red like that in Ruston soils. It is coarser textured than the subsoil of the Magnolia soils. Orangeburg soils are finer textured than Americus soils, especially in the subsoil.

Orangeburg soils are mostly in the central part of the county, and occupy more than one-fourth of the land area. The native vegetation was chiefly pine, oak, hickory, sweetgum, and dogwood. The more gently sloping areas are well suited to most crops grown locally and are mainly in cultivated crops. These areas respond well to management and produce large yields. The steeper areas are in woods, for which they are well suited.

Orangeburg loamy sand, 2 to 5 percent slopes (OeB).—Following is a profile description of this deep, well-drained, friable soil on uplands:

0 to 10 inches, dark grayish-brown loamy sand that is reddish brown in the lower part.
10 to 72 inches, dark-red, friable sandy clay loam with blocky structure.

When this soil is dry the surface layer is grayish brown and the subsoil is red. Generally, the upper 3 to 6 inches of the subsoil is red sandy loam. Small areas of Red Bay, Americus, Magnolia, and Ruston soils are included.

This soil contains a moderate or small amount of organic matter and is low in natural fertility. It is medium or strongly acid. Water enters and moves through the soil rapidly, and a medium amount of moisture is available to plants. The thick root zone is easy to till.

Figure 4.—**Corn grown for silage on Orangeburg loamy sand, 2 to 5 percent slopes, Class II land.**

This soil responds well to good management and is well suited to most crops grown locally. Cotton, corn (fig. 4), peanuts, small grains and soybeans are the main crops. Coastal bermudagrass, common bermudagrass, and bahiagrass are well suited. Cultivated fields are slightly to moderately susceptible to erosion. Less than half of this soil is in cultivated crops. (Capability unit IIe–1; woodland suitability group 1.)

Orangeburg loamy sand, 0 to 2 percent slopes (OeA).—Because it is level or gently sloping and has slower surface runoff than Orangeburg loamy sand, 2 to 5 percent slopes, this soil is less susceptible to erosion. It has a thick root zone and generally is in good tilth. The moisture-supplying capacity is high.

This soil is well suited to most crops grown locally. If adequately limed, fertilized, and otherwise well managed, it produces large yields. All of the small total acreage is in cultivated crops or pasture. (Capability unit I–1; woodland suitability group 1.)

Orangeburg loamy sand, 2 to 5 percent slopes, eroded (OeB2).—This eroded soil has a thinner surface layer than Orangeburg loamy sand, 2 to 5 percent slopes, and generally is in poorer tilth. Surface runoff is more rapid than that of the uneroded soil. The hazard of further erosion is moderate.

This soil is well suited to many kinds of crops. More than half of its extensive acreage is in cultivated crops, and about a fourth is in trees. (Capability unit IIe–1; woodland suitability group 1.)

Orangeburg loamy sand, 5 to 8 percent slopes, eroded (OeC2).—This strongly sloping, eroded soil has a thinner surface layer than Orangeburg loamy sand, 2 to 5 percent slopes. Infiltration is slower than that of the uneroded soil, and the moisture-supplying capacity is lower. The hazard of further erosion is moderate to severe.

This soil is suited to many kinds of crops, but it is better suited to permanent pasture or to hay than to tilled crops. Much of the large total acreage is wooded. (Capability unit IIIe–1; woodland suitability group 1.)

Orangeburg loamy sand, 8 to 12 percent slopes, eroded (OeD2).—Because it is steeper than Orangeburg loamy sand, 2 to 5 percent slopes, this soil is more susceptible to further erosion than the gently sloping soil and has a thinner surface soil. Infiltration is slower, and the moisture-supplying capacity is lower.

This soil is not well suited to cultivated crops, but it can be cultivated occasionally if it is intensively managed. It is best suited to pasture and as woodland. Most of the large acreage is in trees. (Capability unit IVe–1; woodland suitability group 1.)

Orangeburg loamy sand, 12 to 17 percent slopes, eroded (OeE2).—This steep, eroded soil has much more rapid surface runoff than Orangeburg loamy sand, 2 to 5 percent slopes, and a thinner surface layer. Infiltration is slower than that of the uneroded soil, and the moisture-supplying capacity is lower. This soil is susceptible to severe erosion. It is not suited to cultivated crops but is suited to pasture, hay, and trees. All of the large acreage is wooded. (Capability unit VIe–1; woodland suitability group 1.

Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded (OcC3).—This strongly sloping, severely eroded soil has a finer textured, redder surface layer than Orangeburg loamy sand, 2 to 5 percent slopes, and more rapid surface runoff. It contains a smaller amount of organic matter and generally is in poorer tilth. Infiltration is slower than that of the uneroded soil, and the moisture-supplying capacity is lower. Many shallow gullies have formed, and in a few areas, there are a few deep ones.

This soil is not well suited to cultivated crops. If careful management is used to control erosion, this soil can be cultivated occasionally, but it is better suited to pasture, hay, and trees than to cultivated crops. Much of this soil is wooded. (Capability unit IVe–I; woodland suitability group 1.)

Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded (OcD3).—More soil material has washed away from this steep, severely eroded soil than from Orangeburg loamy sand, 2 to 5 percent slopes, and its plow layer is mostly subsoil material that has been mixed with remnants of the surface soil. The plow layer is redder and finer textured than that of the uneroded soil. The tilth is not so good, and the content of organic matter is smaller. Infiltration rate is slower, and natural fertility is lower. Some areas are cut by many shallow gullies and a few deep ones.

This soil is not suited to cultivated crops, but it is suited to permanent pasture and to trees. All the fairly large acreage of this soil is wooded. (Capability unit VIe–1; woodland suitability group 1.)

Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded (OcE3).—Most of the original surface soil has been removed from this steep, severely eroded soil, and the plow layer is mostly reddish-brown to red subsoil material. This soil has many shallow gullies and a few deep ones. It is much more susceptible to further erosion than Orangeburg loamy sand, 2 to 5 percent slopes. It is not suited to cultivated crops. All the large acreage is in trees, for which it is best suited. (Capability unit VIIe–1: woodland suitability group 1.)

Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded (OcF3).—The steep slopes and very severe erosion hazard distinguish this soil from Orangeburg loamy sand, 2 to 5 percent slopes. The plow layer is reddish-brown to red sandy loam and is chiefly subsoil material. There are many small gullies and an occasional deep one. Surface runoff is rapid to very rapid. Water enters the soil moderately slowly, and only a small amount of moisture is available to plants. This soil is not suited to cultivated crops but is best suited to trees. All of its extensive acreage is wooded. (Capability unit VIIe–1; woodland suitability group 1.)

Orangeburg loamy sand, thick surface, 2 to 5 percent slopes (OdB).—This soil has a thicker surface layer than Orangeburg loamy sand, 2 to 5 percent slopes. The surface layer ranges from 18 to 30 inches in thickness, but water moves through it more rapidly than it does through the surface layer of the thinner soil, and less moisture is available to plants. Surface runoff is slow.

This soil is suited to a fairly wide variety of crops but is somewhat droughty. About half of this soil is in cultivated crops, and the rest is in trees. (Capability unit IIs–1; woodland suitability group 1.)

Orangeburg loamy sand, thick surface, 5 to 8 percent slopes (OdC).—This strongly sloping soil has a thicker surface layer than Orangeburg loamy sand, 2 to 5 percent slopes. The surface layer is 18 to 30 inches thick. Because infiltration and permeability are more rapid, this soil has a lower moisture-supplying capacity than Orangeburg loamy sand, 2 to 5 percent slopes. Surface runoff is more rapid, and the erosion hazard is greater. The content of organic matter is small, and natural fertility is low. This soil is suited to many kinds of crops, but because it is somewhat droughty, yields are only fair. Nearly all of the acreage is in trees. (Capability unit IIIe–5; woodland suitability group 1.)

Red Bay Series

The Red Bay series consists of deep, friable, well-drained soils on uplands. These soils are strongly acid and nearly level to moderately steep. They developed in beds of sand and sandy clay on the Coastal Plain.

Red Bay soils are associated with Greenville, Orangeburg, Ruston, Eustis, and Americus soils. They are similar to Greenville soils in color but are coarser textured in the subsoil than those soils. Their surface layer is darker than that of the Orangeburg soils, and their subsoil is redder than that of the Ruston soils or the Eustis soils. Red Bay soils are finer textured than the Eustis and Americus soils.

In this county Red Bay soils occur in the central part and make up less than 1 percent of the land area. About half of this area is cultivated, and the rest is in woodland. These soils have a thick root zone, generally are in good tilth, and respond well to good management. The less sloping areas are well suited to many kinds of crops.

Red Bay loamy sand, 0 to 2 percent slopes (RgA).—A brief profile description of this deep, well-drained, friable soil on uplands follows:

0 to 7 inches, dark-brown to dark reddish-brown loamy sand.
7 to 17 inches, dusky-red sandy loam.

17 to 40 inches, dark-red, friable sandy clay loam with blocky structure.
40 to 50 inches +, dark-red sandy loam.

Included with this soil are areas that have a sandy loam surface layer. Also included are small areas of Greenville, Orangeburg, Eustis, and Americus soils.

This strongly acid soil contains a medium to small amount of organic matter and is low in natural fertility. It has very slow surface runoff. Water enters and moves through the soil rapidly, and a moderate amount of moisture is available to plants. Erosion is not a hazard.

This soil has a thick root zone and generally is in good tilth. It is suited to many kinds of crops grown locally. If adequately fertilized, limed, and otherwise well managed, it produces large yields. All of the small total acreage is cultivated. (Capability unit I–1; woodland suitability group 1.)

Red Bay loamy sand, 2 to 5 percent slopes (RgB).—This sloping soil has more rapid surface runoff than Red Bay loamy sand, 0 to 2 percent slopes, and is more likely to erode. It is suited to most cultivated crops grown locally. If properly limed, fertilized, and otherwise well managed, it produces moderate yields. All of the small total acreage is in cultivated crops or in pasture. (Capability unit IIe–1; woodland suitability group 1.)

Red Bay loamy sand, 2 to 5 percent slopes, eroded (RgB2).—This sloping, eroded soil has a thinner surface layer than Red Bay loamy sand, 0 to 2 percent slopes, and is more susceptible to further erosion. Water enters this soil more slowly than it enters the more gently sloping soil, and less moisture is available to plants. If it is managed moderately intensively to control erosion, this soil produces moderate yields. Most of the large total acreage is cultivated. (Capability unit IIe–1; woodland suitability group 1.)

Red Bay loamy sand, 5 to 8 percent slopes, eroded (RgC2).—This strongly sloping, eroded soil has more rapid surface runoff than Orangeburg loamy sand, 0 to 2 percent slopes, and a thinner surface layer. Water enters this soil more slowly than it enters the gently sloping soil, and less moisture is available to plants. The content of organic matter is small, and natural fertility is low. If this soil is intensively managed to control erosion, it can be cultivated and will produce moderate yields. All of the small total acreage is wooded. (Capability unit IIIe–1; woodland suitability group 1.)

Red Bay loamy sand, 8 to 12 percent slopes, eroded (RgD2).—Because it has much stronger slopes and more rapid surface runoff than Red Bay loamy sand, 0 to 2 percent slopes, this soil is more susceptible to severe erosion. It has a thinner surface layer than the nearly level soil. Water enters this soil more slowly, and less moisture is available to plants. If intensive management is used to control erosion, this soil can be cultivated occasionally. But it is better suited to permanent pasture and hay than to tilled crops. All of the small total acreage is wooded. (Capability unit IVe–1; woodland suitability group 1.)

Ruston Series

The Ruston series consists of deep, friable, well-drained soils on uplands. These soils are strongly acid and nearly level to strongly sloping. They developed in thick beds of sandy clay loam that, in some places, contained a layer of sand, sandy clay, or loamy sand.

Ruston soils are associated with Orangeburg, Red Bay, Norfolk, and Faceville soils. They are not so red in the subsoil as Orangeburg and Red Bay soils but are redder in the subsoil than the Norfolk soils. They do not have a fine-textured subsoil like that in Faceville soils.

In Twiggs County, Ruston soils occur mostly in the central and southeastern parts. They make up slightly more than 1 percent of the land area. The less sloping areas are well suited to many kinds of crops and, if well managed, produce large yields. The native vegetation is chiefly pine mixed with hardwoods.

Ruston loamy sand, 2 to 5 percent slopes (RiB).—A profile of this deep, well-drained, friable soil on uplands is described as follows:

0 to 14 inches, dark grayish-brown loamy sand in upper part and yellowish-brown sandy loam in the lower part.
14 to 36 inches, yellowish-red, friable sandy clay loam with blocky structure.
36 to 60 inches +, red sandy clay loam mottled with brownish yellow.

The subsoil ranges from yellowish red to red. Included with this soil are areas that have a sandy loam surface layer.

This strongly acid soil is moderate to low in natural fertility and moderate to low in organic matter. Water enters the soil easily, and a moderate amount of moisture is available to plants. The erosion hazard is slight to moderate. The root zone is thick, and tilth generally is good. This soil responds well to good management and is well suited to many kinds of crops. Management to control erosion is needed if this soil is cultivated. The total acreage is small and is mostly in cultivated crops. (Capability unit IIe–1; woodland suitability group 1.)

Ruston loamy sand, 2 to 5 percent slopes, eroded (RiB2).—This eroded soil has a thinner surface layer than Ruston loamy sand, 2 to 5 percent slopes, and is moderately susceptible to further erosion. Water enters the soil more slowly than it does the uneroded soil. Tilth generally is not so good.

This soil is suited to many kinds of crops. If the soil is terraced, tilled on contour, and otherwise well managed to control erosion, yields will be good. Much of the acreage is in cultivated crops. (Capability unit IIe–1; woodland suitability group 1.)

Ruston loamy sand, 5 to 8 percent slopes, eroded (RiC2).—This sloping, eroded soil has more rapid surface runoff than Ruston loamy sand, 2 to 5 percent slopes, and is thinner in the surface layer. It is more susceptible to further erosion. Water enters the soil more slowly than it enters the uneroded soil.

This soil is suited to many kinds of crops. If it is terraced, tilled on the contour, and otherwise well managed to control erosion, it produces moderate yields. Most of the small total acreage is wooded. (Capability unit IIIe–1; woodland suitability group 1.)

Ruston loamy sand, thick surface, 2 to 5 percent slopes (RjB).—This soil has a slightly sandier and a much thicker surface layer than Ruston loamy sand, 2 to 5 percent slopes. The surface layer ranges from 18 to 30 inches in thickness. This soil is suited to most crops grown locally, but because the thick, sandy surface layer is droughty in dry periods, crops may be damaged. About

half of the small total acreage is in cultivated crops. (Capability unit IIs–1; woodland suitability group 1.)

Ruston loamy sand, thick surface, 5 to 8 percent slopes (RjC).—This strongly sloping soil is slightly sandier and much thicker in the surface layer than Ruston loamy sand, 2 to 5 percent slopes, and is more susceptible to erosion. Infiltration and permeability are more rapid than in the thinner soil, and the moisture-supplying capacity is lower. This soil is low in natural fertility and contains a small amount of organic matter. It can be cultivated if intensive management is used to control erosion. Yields are only fair. Pasture generally is a better use than tilled crops. (Capability unit IIIe–5; woodland suitability group 1.)

Sands Over Kaolinitic Deposits

Shallow sands underlain by kaolinitic materials of variable thickness and quality make up this land type.

Sands over kaolinitic deposits (Sok).—The shallow sands of this land type are on knolls and sloping ridgetops and are underlain by kaolinitic material. Slopes are short and irregular and range from 3 to 17 percent. In eroded areas the surface layer is sand or loamy sand. The kaolinitic material is at the surface in galled and eroded spots, which are common at the slope breaks and in other exposed places. This material is clay and is firm and brittle when dry and plastic when wet. It is dominantly white, but it is streaked and splotched with various colors.

Because surface runoff is rapid and permeability is slow, this land is droughty. It contains a small amount of organic matter and is low in natural fertility.

This land type makes up about 2 percent of the county and is in the northern part. All of the acreage is in second-growth pine and hardwoods. Clay is mined in large quantities from the better deposits. (Capability unit VIIe–2; woodland suitability group 6.)

Sandy and Clayey Land

This land type has been mapped in three phases according to its range in slope and degree of erosion.

Sandy and clayey land, gently sloping, eroded (SkC2).—This land is made up of sandy and clayey, old marine sediments. These old deposits have varied characteristics. Most of this land is on ridgetops and gentle side slopes in the sandhills of the northern part of the county. Slope ranges from 3 to 8 percent.

In most places, especially in the more eroded areas, the clay is only a few inches from the surface. Washouts and galled spots are common, and there are a few gullies. In many spots, however, the sand is several feet thick over the clayey materials.

The clayey material normally is yellow or brown, but in some places it is red. It is generally mottled. A thin, discontinuous B horizon may be present. The clayey material generally ranges from firm to cemented but is friable in places. A small acreage in the central part of the county is pebbly.

This land makes up about 4 percent of the county. Most of it has been cut over recently and is in loblolly pine, shortleaf pine, and upland hardwoods. Some of the better areas are in cultivated crops. This land contains a small amount of organic matter and is low in natural fertility. The rate of infiltration differs from place to place. Because it varies greatly within short distances, this land is of limited use. (Capability unit IVe–4; woodland suitability group 6.)

Sandy and clayey land, sloping, eroded (SkD2).—This land is on the short, broken side slopes of ridges and along the sides of entrenched streams. It is on stratified, old marine sediments consisting of sand and clay. These sediments crop out in many places. Washouts and galled spots are common, and there are a few gullies. Slope ranges from 8 to 12 percent.

The sandy and clayey materials are normally brown, yellow, or red, and are commonly mottled. A thin, discontinuous B horizon is present in some places. The clayey material generally ranges from firm to plastic, but it is friable in places. The sandy material is generally loose to weakly cemented.

This land makes up about 5 percent of the county. All of the acreage has been cut over recently and is in loblolly and shortleaf pines and upland hardwoods. The content of organic matter and the natural fertility are low. Because surface runoff is very rapid, the erosion hazard is severe. This land is not suited to cultivated crops. It can be used for permanent pasture but is best suited to trees. (Capability unit VIe–2; woodland suitability group 6.)

Sandy and clayey land, strongly sloping, severely eroded (SkE3).—This land is on moderate slopes, on strong slopes, and on a few steep slopes and occasional bluffs. It is in the northern part of the county where streams have cut deeply into old, stratified, marine sediments of sand and clay texture. Sandy and clayey materials crop out in many places along the slopes and ridges. This land is rough; it is generally severely eroded and has short, broken slopes of 8 percent or more. Many places are washed out or galled, and some places are gullied.

The sandy and clayey materials are normally brown or yellow but in some places are red. They are generally mottled. The clayey material ranges from firm to weakly cemented but is friable in places. The sandy material generally ranges from loose to weakly cemented.

This land makes up about 3 percent of the county. All of it has been cut over recently and is in pine and upland hardwoods. Its soil material contains a small amount of organic matter and is low in natural fertility. Surface runoff is very rapid, and the erosion hazard is severe. Forestry is the best use. (Capability unit VIIe–2; woodland suitability group 6.)

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained soils on uplands. These soils are gently sloping to moderately steep. They developed in thick beds of acid, plastic clay and are strongly acid.

Susquehanna soils are associated with Oktibbeha, Eutaw, and Binnsville soils. They are not so well drained as Oktibbeha soils and are not so red throughout the profile. They are strongly acid throughout the profile, whereas the Oktibbeha and Eutaw soils are alkaline in the lower part. The surface layer of the Susquehanna soils is not so dark, fine textured, or alkaline as that of the Binnsville soils.

Susquehanna soils make up about 5 percent of the county. In the southwestern part these soils are mapped

in a complex with Oktibbeha and Eutaw soils; in the central and northern parts of the county they are mapped as single soils. All of the acreage is wooded. Because they have a dense clay subsoil and a thin root zone, these soils are not suited to cultivated crops. They are best suited as woodland, but some areas can be used for pasture.

Susquehanna sandy loam, 2 to 8 percent slopes, eroded (SiC2).—A profile description of this somewhat poorly drained soil of the uplands follows:

0 to 4 inches, dark-gray sandy loam.
4 to 30 inches, highly mottled, gray, red, and yellowish-brown, very plastic clay with blocky structure.
30 to 72 inches, light brownish-gray, very sticky clay mottled with strong brown.

The surface soil ranges from 4 to 8 inches in thickness. Some areas that have a red, dense clay subsoil are included.

Surface runoff is moderately rapid on this soil, and the erosion hazard is severe. Water enters the surface layer rapidly but moves very slowly through the clayey subsoil. The moisture-supplying capacity is low. This soil contains a small amount of plant nutrients and organic matter. Because the clayey subsoil is near the surface, tillage is difficult. This soil is best suited as woodland but can be used for pasture. (Capability unit VIe–2; woodland suitability group 6.)

Susquehanna sandy loam, 8 to 17 percent slopes, eroded (SiE2).—This soil is on short, broken side slopes along the sides of entrenched streams. It has many washouts and galled spots and a few gullies. Surface runoff is rapid, and the erosion hazard is severe. Permeability is slow. This soil is not suited to cultivated crops, but some areas can be used for pasture if grazing is controlled. All of the fairly large acreage is in pine and upland hardwoods. Forestry is the best use. (Capability unit VIIe–2; woodland suitability group 6.)

Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded (SjC3).—This severely eroded soil is finer textured in the surface layer than Susquehanna sandy loam, 2 to 8 percent slopes, eroded. The plow layer consists of the original surface layer mixed with subsoil. Many places are washed out, and some spots are galled. Because the root zone is very thin and the hazard of further erosion is severe, this soil is not suited to cultivated crops. All of the small total acreage is woodland and is best suited to that use. (Capability unit VIIe–2; woodland suitability group 6.)

Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded (SjD3).—This severely eroded soil is finer textured in the surface layer than Susquehanna sandy loam, 2 to 8 percent slopes, eroded. In many places plastic clay is exposed in galled spots and washouts. The present surface layer consists of remnants of the original surface layer mixed with subsoil. Because of the very great erosion hazard and the thin root zone, this soil is not suited to cultivated crops. Some areas can be used for pasture if grazing is controlled. All of the acreage is woodland and is best suited to that use. (Capability unit VIIe–2; woodland suitability group 6.)

Swamp

In Twiggs County, Swamp is on flood plains and first bottoms along large streams.

Swamp (Swa).—This land type is along the Ocmulgee River and other large streams in the western part of the county. Because it is on flood plains and first bottoms, it is likely to be flooded frequently and is covered with water for long periods. This land is developing in mixed alluvium that washed from the surrounding soils on uplands, but distinct soil layers have not formed. Swamp contains a large amount of organic matter. Its vegetation is hardwood trees and an understory of vines, ferns, shrubs, and other water-loving plants. Because it is frequently flooded, this land is not suited to cultivated crops. It is best suited as woodland and as a habitat for wildlife. (Capability unit VIIw–1; woodland suitability group not assigned.)

Figure 5.—**Concretions of iron between rows of peanuts on Tifton soil.**

Tifton Series

The Tifton series consists of deep, friable, well-drained soils on uplands. These soils are gently sloping and moderately sloping. They developed in marine sediments consisting of sandy clay and are medium acid to strongly acid. Many, hard, small, brown to reddish-brown concretions of iron are on the surface (fig. 5) and throughout the profile.

Tifton soils are associated with Norfolk, Ruston, Faceville, and Lakeland soils, all of which generally lack iron concretions. Tifton soils are browner in the surface layer than are Norfolk soils and are finer textured in the B horizon. They are finer textured throughout the profile than Lakeland soils.

Tifton soils are widely distributed through the southeastern part of the county. They are well suited to most crops grown locally, and about 60 percent of the acreage is in cultivated crops. The native vegetation is chiefly pine, oak, hickory, and shrubs.

Tifton fine sandy loam, 2 to 5 percent slopes, eroded (TfB2).—This is a deep, well-drained soil on uplands. Many, small, hard, rounded concretions of iron occur throughout. A brief description of a profile follows:

0 to 8 inches, fine sandy loam that is dark grayish brown in the upper part and yellowish brown in the lower.

8 to 24 inches, yellowish-brown, friable sandy clay loam with blocky structure.
24 to 50 inches +, strong-brown sandy clay to sandy clay loam that is mottled in the lower part with brownish yellow, red, and yellowish red.

The surface layer varies in color, in thickness, and in the size and quantity of the concretions it contains. Included with this soil are areas that have a surface layer of sandy loam or loamy sand. Small areas of Norfolk and Lakeland soils are also included.

This strongly acid soil is moderate in fertility and contains a medium to small amount of organic matter. It has a thick root zone and is generally in good tilth. The erosion hazard is moderate. Water enters into and moves through the soil rapidly, and moisture in moderate amounts is available to plants. Much of this extensive soil is in cultivated crops. It responds to good management and is well suited to many kinds of crops.

Cotton, corn, peanuts, and small grains are the main crops. If it is adequately fertilized, limed, and otherwise well managed, this soil produces good yields. (Capability unit IIe–2; woodland suitability group 1.)

Tifton fine sandy loam, 2 to 5 percent slopes (TtB).—This gently sloping soil has slower surface runoff and a thicker surface layer than Tifton fine sandy loam, 2 to 5 percent, eroded. Tilth is generally better than in the eroded soil, and infiltration is faster.

This soil is suited to many kinds of crops. If the soil is adequately limed, fertilized, and otherwise well managed, large yields of crops can be expected. In cultivated fields, however, erosion is a slight to moderate hazard. About half of this soil is in cultivated crops. (Capability unit IIe–2; woodland suitability group 1.)

Tifton fine sandy loam, 5 to 8 percent slopes, eroded (TtC2).—Because slopes are stronger and surface runoff is more rapid on this soil than on Tifton fine sandy loam, 2 to 5 percent slopes, eroded, infiltration is slower and the erosion hazard is greater.

This soil is suited to many kinds of crops, but it is better suited to pasture or hay than to crops. If intensive management is used to control erosion, it can be cultivated safely. About half of the small total acreage is in cultivated crops. (Capability unit IIIe–2; woodland suitability group 1.)

Wahee Series

The Wahee series consists of deep, moderately well drained and somewhat poorly drained, strongly acid soils on stream terraces. These soils formed in alluvium washed from surrounding uplands of the Coastal Plain.

The Wahee soils are associated with the Izagora, Lakeland, and Eustis soils. They have a finer textured subsoil and are not so well drained as those soils.

In Twiggs County, Wahee soils are in the western part along the Ocmulgee River. They make up less than 1 percent of the county. Much of the acreage is wooded or is idle. If adequately drained, these soils can be used for cultivated crops, but yields will be only fair.

Wahee loamy sand (0 to 2 percent slopes) (Wah).—Following is a brief description of this deep, moderately well drained and somewhat poorly drained soil on stream terraces.

0 to 6 inches, grayish-brown loamy sand.
6 to 27 inches, mottled, yellowish-brown, firm fine sandy clay to clay with blocky structure.
27 to 37 inches +, light brownish-gray sandy clay to clay highly mottled with red and yellowish brown.

The surface layer of this soil varies in thickness in some areas. It is sandy loam in some areas, and in a few areas it is more than 18 inches thick. A few areas are flooded occasionally.

Because its subsoil is clayey, this soil has slow permeability. Infiltration, however, is moderately rapid, and the moisture-supplying capacity is moderate. The natural fertility and content of organic matter are low.

Tilth is good. If adequately drained, fertilized, and otherwise well managed, this soil can produce fair yields. Excess surface water can be removed from fields by digging ditches and arranging the crop rows. (Capability unit IIIw–5; woodland suitability group 2.)

Wahee loamy sand, thick surface (0 to 2 percent slopes) (Wat).—The surface layer of this soil ranges from 12 to 24 inches in thickness and is thicker than that of Wahee loamy sand, 0 to 2 percent slopes. Infiltration is more rapid than it is in the thinner soil, and the moisture-supplying capacity is higher. Tilth is generally good.

This soil is suited to a fairly wide variety of crops. If the soil is drained by ordinary means and is well managed, yields of cultivated crops will be good. But this soil generally is better suited to pasture or hay than to cultivated crops. Most of the small total acreage is wooded. (Capability unit IIIw–5; woodland suitability group 2.)

Wehadkee Series

The Wehadkee series consists of deep, poorly drained, very strongly acid soils in recent alluvium on first bottoms. These soils are frequently flooded.

Wehadkee soils are associated with Chewacla soils and with Swamp. They are more poorly drained than Chewacla soils and are somewhat finer textured throughout the profile. Fairly distinct layers have developed in Wehadkee soils but not in the soil material mapped as Swamp.

These soils are not well suited to cultivated crops. They are poorly drained, chiefly because the water table is high. All of the small total acreage is wooded.

Wehadkee silty clay loam (Weh).—This is a deep, poorly drained soil on the flood plain of the Ocmulgee River. A brief description of a profile follows:

0 to 6 inches, very dark gray silty clay loam.
6 to 24 inches, mottled, gray, friable silty clay loam.
24 to 36 inches +, gray silty clay loam to silty clay with many strong-brown and dark reddish-brown mottles.

In some areas the surface layer is lighter than very dark gray. A few areas are better than poorly drained, and in these places the soil is browner and less mottled. Small mica flakes occur throughout the profile in some places.

This soil contains a medium to large amount of organic matter and a small amount of plant nutrients. It is very strongly acid. The moisture-supplying capacity is high.

If adequately drained, this soil can be cultivated occasionally. Because the water table is high and floods are frequent, only a few crops can be grown. All of the small total acreage is wooded. (Capability unit IVw–1; woodland suitability group 3.)

Wet Alluvial Land

This land is in drainageways and consists of alluvial soil material that varies greatly from place to place. The soil material also changes from time to time as alluvium is brought in or taken away.

Wet alluvial land (Wtl).—This land type is made up of very strongly acid soil material that has washed into drainageways from adjacent uplands. It is poorly drained. The material is stratified and varies greatly in color, texture, and consistence. In many places the sandy surface layer is 20 to 30 inches thick over highly mottled, gray sandy clay or sandy clay loam.

This land is frequently flooded. Each flood changes the profile because some material is deposited and some is washed away. There is not enough time between floods for a true soil to develop. Because water covers this land for long periods, a large amount of organic matter accumulates. Areas that are drained, however, rapidly lose much of this organic matter through oxidation.

This land is not suited to cultivated crops. Drained areas can be used for pasture but are probably better suited as woodland. Good sites for farm ponds are at narrow parts of the drainageways where the soil on the adjacent side slopes is suitable for construction and maintenance. This land makes up about 9 percent of the county. All of it, except areas in open water, is wooded. (Capability unit Vw–2; woodland suitability group 3.)

Use and Management of Soils

This section describes capability classification and the use and management of soils for crops and pasture, as woodland, for wildlife, and in engineering work. The soils of the county are placed in capability units, or management groups, and the use and management of the units are discussed. A table of estimated yields tells what each soil in the county is expected to produce under two levels of management. Woodland suitability groups of soils are set up so that the management of the soils as woodland can be discussed more readily. The last subsection discusses the use of soils in engineering work.

Capability Grouping

The capability classification is a grouping of soils that shows, in a general way, how suitable the soils are for most kinds of farming. It is a practical grouping based on limitations of the soils, the risk of damage when they are used, and the way they respond to treatment.

In this system all the kinds of soil are grouped at three levels, the capability class, subclass, and unit. Eight capability classes are in the broadest grouping and are designated by Roman numerals I through VIII. In class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. Twiggs County has no soils of Class VIII.

The subclasses indicate major kinds of limitations within the classes. Within most of the classes there can be up to four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil will interfere with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; *c*, used in only some parts of the country, but not in Twiggs County, indicates that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it have little or no erosion hazard but have other limitations that limit their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned locally, for example, IIe–1 or IIIe–2.

Soils are classified in capability classes, subclasses and units in accordance with the degree and kind of their permanent limitations; but without consideration of major and generally expensive landforming that would change the slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamations projects.

The eight classes in the capability system, and the subclasses and units in Twiggs County, are described in the list that follows.

Class I. Soils that have few limitations that restrict their use.

- Capability unit I–1.—Deep, well-drained, nearly level soils that are on uplands and have a friable, red to yellow sandy clay loam subsoil.
- Capability unit I–2.—Deep, well-drained, nearly level soils that are on uplands and have a friable to firm, red sandy clay subsoil.

Class II. Soils that have some limitations that reduce the choice of plants or require moderate conservation practices.

Subclass IIe. Soils subject to moderate erosion if they are not protected.

- Capability unit IIe–1.—Deep, well-drained, slightly to moderately eroded soils that are on gently sloping uplands and have a friable, red to yellow sandy clay loam subsoil.
- Capability unit IIe–2.—Deep, well-drained, slightly to moderately eroded soils that are on gently sloping uplands and have a friable to extremely firm, dark-red to yellowish-brown sandy clay to sandy clay loam subsoil.

Subclass IIw. Soils that have moderate limitations because of excess water.

- Capability unit IIw–1.—Deep, moderately well drained and somewhat poorly drained, friable soil in slight depressions and draws.

Capability unit IIw–2.—Deep, friable, moderately well drained and somewhat poorly drained soils that are on nearly level stream terraces and uplands and have a sandy clay loam to sandy clay subsoil.

Subclass IIs. Soils that have moderate limitations of moisture-holding capacity or tilth.

Capability unit IIs–1.—Somewhat droughty, sandy, gently sloping soils that are on uplands and have a thick sandy surface layer.

Class III. Soils that have severe limitations that reduce the choice of plants or require special conservation practices, or both.

Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.

Capability unit IIIe–1.—Well-drained, gently sloping, moderately eroded soils that are on uplands and have a friable, yellow to red sandy clay loam subsoil.

Capability unit IIIe–2.—Well-drained, gently sloping, moderately eroded soils that are on uplands and have a yellowish-brown to dark-red, friable to firm sandy clay to sandy clay loam subsoil.

Capability unit IIIe–5.—Well-drained, gently sloping soils that are on uplands and have a thick sandy surface layer.

Subclass IIIw. Soils that have severe limitations because of excess water.

Capability unit IIIw–2.—Poorly drained soils in saucerlike depressions and sinks.

Capability unit IIIw–3.—Somewhat poorly drained and moderately well drained, medium-textured soils on flood plains.

Capability unit IIIw–5.—Somewhat poorly drained and moderately well drained, gently sloping soils that are on stream terraces and have a clayey subsoil.

Subclass IIIs. Soils that have severe limitations of moisture-holding capacity or tilth.

Capability unit IIIs–1.—Droughty, nearly level and gently sloping sandy soils on uplands.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Capability unit IVe–1.—Well-drained, moderately and severely eroded soils that are on gently sloping to strongly sloping uplands and have a friable sandy clay loam subsoil.

Capability unit IVe–2.—Well-drained, moderately eroded, strongly sloping soils that are on uplands and have a friable to firm sandy clay subsoil.

Capability unit IVe–4.—Moderately eroded, gently sloping, variable soils on uplands.

Subclass IVw. Soils that have very severe limitations for cultivation because of excess water.

Capability unit IVw–1.—Low-lying, nearly level, poorly drained soils that are on bottoms and are subject to frequent flooding.

Subclass IVs. Soils that have very severe limitations of low moisture-holding capacity or of other soil features.

Capability unit IVs–1.—Deep or very deep, nearly level to strongly sloping, sandy soils on uplands and terraces.

Class V. Soils not likely to erode but that have other limitations, impractical to remove without major reclamation, that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass Vw.—Soils that are too wet for cultivated crops and are in places where drainage or protection is not feasible.

Capability unit Vw–2.—Poorly drained, variably textured soils that are in drainageways and have a water table near or above the surface much of the time.

Class VI. Soils with limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture or range, woodland, or wildlife food and cover.

Subclass VIe. Soils that are severely limited, chiefly by risk of erosion unless protective cover is maintained.

Capability unit VIe–1.—Well-drained, severely eroded, sloping soils, and moderately eroded, strongly sloping soils.

Capability unit VIe–2.—Moderately eroded, nearly level to strongly sloping, variably textured soils that are on uplands and have short, broken slopes.

Capability unit VIe–3.—Moderately well drained, gently sloping, alkaline, soils that are on uplands and are clayey and shallow over marl.

Subclass VIs. Soils generally unsuitable for cultivation and limited for other uses by their low moisture-holding capacity or by other physical characteristics.

Capability unit VIs–1.—Very deep, somewhat excessively drained sandy soils on strongly sloping uplands.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to limited grazing, woodland, or wildlife.

Subclass VIIe. Soils very severely limited, chiefly by risk of erosion unless protective cover is maintained.

Capability unit VIIe–1.—Well-drained, strongly sloping to steep, severely eroded soils.

Capability unit VIIe–2.—Moderately eroded to severely eroded, nearly level to steep, variably textured soils that are on short, broken slopes.

Capability unit VIIe–3.—Soils so severely gullied by erosion that they are unfit for cultivated crops or pasture.

Subclass VIIw. Soils very severely limited by excess water.

Capability unit VIIw–1.—Swampland that is subject to frequent flooding and land that is covered by water for long periods.

Class VIII. Soils and landforms that are so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

No class VIII soils or landforms were mapped in Twiggs County.

Crops and Pasture [2]

In this subsection, the soils of the county are placed in capability units and their use and management for crops, pasture, and other uses are discussed. Their uses as woodland, for wildlife habitats, and in engineering work are discussed in succeeding subsections.

CAPABILITY UNIT I–1

Capability unit I–1 consists of deep, well-drained, nearly level, red and yellow soils on uplands. The surface layer is very friable loamy sand, 7 to 11 inches thick. The subsoil is friable, red to yellow sandy clay loam. These soils have a thick root zone.

Infiltration, permeability, and moisture-supplying capacity are moderate. These soils are medium acid or strongly acid and generally contain a small amount of organic matter. Their rather thick, sandy surface layer normally is in good tilth and is easy to plow. These soils are moderate to low in fertility and are easily conserved. They respond well to fertilization. They are—

Norfolk loamy sand, 0 to 2 percent slopes.
Orangeburg loamy sand, 0 to 2 percent slopes.
Red Bay loamy sand, 0 to 2 percent slopes.

These soils occupy about 1 percent of the county. About 85 percent of the acreage is cultivated, 10 percent is pastured, and 5 percent is wooded. Many kinds of crops are suitable. Under good management, corn, cotton, peanuts, soybeans, oats, wheat, and rye produce high yields. Well-suited legumes are sericea lespedeza, crimson clover, common lespedeza, lupine, and crotalaria. Suitable grasses are common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, and ryegrass. Pecans, truck crops, and nursery crops are also productive.

If they are managed well, these soils can be cultivated intensively without losing a large amount of soil material or plant nutrients through water erosion. Soil structure and good tilth can be maintained by using one or more of these practices: Adding fertilizer and lime, planting cover and green-manure crops, managing crop and animal residues, and planting suitable crops in an appropriate sequence.

Suitable cropping systems:

(1) *First, second, and third years:* Row crops. *Fourth year:* Small grain and summer legume.
(2) *Continuously:* Row crops with winter legume in alternate years.
(3) *First, second, and third year:* Row crops. *Fourth and fifth years:* Sod crops.
(4) *Continuously:* Row crops in combination with a reseeding legume that is harvested every third year.

The soils in this unit are well suited to sprinkler irrigation, especially when row crops of high value are grown.

[2] J. B. Hungerford, management agronomist, Soil Conservation Service, assisted in writing this subsection.

Figure 6.—**Soybeans mulch-planted in oat stubble to conserve moisture and organic matter. The soil is Greenville sandy loam, 0 to 2 percent slopes.**

CAPABILITY UNIT I–2

Capability unit I–2 consists of deep, well-drained, nearly level, medium acid or strongly acid soils on uplands. These soils are finer textured than those in capability unit I–1 and have a thinner surface layer. The surface soil is very friable sandy loam, 6 to 8 inches thick. The subsoil is friable to firm, red sandy clay. Roots penetrate effectively to a depth of 36 to 60 inches or more.

Surface runoff is slow, and infiltration is moderately rapid. Permeability is moderately slow, and the moisture-supplying capacity is moderate. Soil structure and tilth generally are good. These soils usually contain a small amount of organic matter and a moderate amount of plant nutrients. They respond well to fertilization and are easily conserved. They are—

Greenville sandy loam, 0 to 2 percent slopes.
Magnolia sandy loam, 0 to 2 percent slopes.

These soils occupy about 0.5 percent of the county. About 90 percent of their acreage is cultivated, 5 percent is pastured, and 5 percent is wooded. Many kinds of crops can be grown. Under good management, corn, cotton, peanuts, soybeans, oats, wheat, and rye are well suited. Sericea lespedeza, crimson clover, common lespedeza, lupine, and crotalaria are well-suited legumes. Suitable grasses are common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, and ryegrass. Pecan trees, truck crops, and nursery crops also do well.

If they are well managed, these soils can be cultivated intensively without losing a large amount of plant nutrients or of soil material through erosion. But the soils clod if they are plowed when they are wet. To maintain organic matter, follow a cropping system in which the crop residue is left at or near the surface as shown in figure 6. Soil structure and good tilth can be maintained by using one or more of the following practices: Adding fertilizer and lime, seeding cover or green-manure crops, managing crop and animal residues, and planting suitable crops in an appropriate sequence.

Suitable cropping systems:

(1) *First, second, and third years:* Row crops. *Fourth year:* Small grain and a summer legume.
(2) *Continuously:* Row crops with a winter legume in alternate years.
(3) *First, second, and third years:* Row crops. *Fourth and fifth years:* Sod crops.
(4) *Continuously:* Row crops in combination with a reseeding legume that is harvested every third year.

CAPABILITY UNIT IIe–1

Capability unit IIe–1 consists of deep, well-drained, gently sloping soils on uplands. The surface layer of these soils is 3 to 8 inches of loose or very friable loamy sand. Most of the acreage has been cultivated and eroded. In eroded areas the plow layer generally contains some subsoil material. The subsoil is friable, red to yellow sandy clay loam.

Surface runoff is medium to slow, and further erosion is likely if these soils are unprotected. Infiltration is moderately rapid. Permeability and the moisture-supplying capacity are moderate. These soils are medium acid or strongly acid and generally contain a small amount of organic matter. They have a thick root zone. They contain a moderate to small amount of plant nutrients but respond well to fertilization. The tilth of the plow layer and the soil structure are generally good. These soils are easy to till and to conserve. They are—

Norfolk loamy sand, 2 to 5 percent slopes.
Norfolk loamy sand, 2 to 5 percent slopes, eroded.
Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded.
Orangeburg loamy sand, 2 to 5 percent slopes.
Orangeburg loamy sand, 2 to 5 percent slopes, eroded.
Red Bay loamy sand, 2 to 5 percent slopes.
Red Bay loamy sand, 2 to 5 percent slopes, eroded.
Ruston loamy sand, 2 to 5 percent slopes.
Ruston loamy sand, 2 to 5 percent slopes, eroded.

These soils occupy about 11 percent of the county. About 40 percent of their acreage is cultivated, 10 percent is pastured, and 50 percent is wooded. Many kinds of crops can be grown. Under good management corn, cotton, peanuts, soybeans, oats, wheat, and rye are well suited. Suitable grasses are common bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass. Sericea lespedeza, crimson clover, common lespedeza, lupine, and crotalaria are well-suited legumes. Pecan trees, truck crops, and nursery crops also grow well.

To control erosion, plant, at least once in every 2 or 3 years, a close-growing crop, a crop that leaves much residue, or some other soil-improving crop. Fields used for row crops should be terraced and tilled on the contour or planted in alternating strips of row crops and close-growing crops. Vegetated waterways will remove excess water from crop rows and from terraces. For good yields, apply fertilizer and lime according to the needs of the crop selected and the results of soil tests. To maintain organic matter and a good soil structure, follow cropping systems that keep crop residue at or near the surface. These soils can be kept highly productive by applying fertilizer as needed and by using water-control structures and good cropping systems.

Suitable cropping systems:

(1) *First year:* Peanuts followed by a small grain that is drilled without other land preparation. *Second year:* Graze or harvest small grain and then plant soybeans, grain sorghum, or cowpeas or let the field grow up in native cover; leave native cover, stubble, or both on surface all winter; to increase the supply of nitrogen, plant lupine with minimum disturbance of soil. *Third year:* Plant corn, use shallow cultivation, and lay by early; after harvest, beat down stalks with a stalk cutter or rotary mower and allow residue to cover the soil through winter.
(2) *First year:* Corn followed by oats. *Second year:* Harvest oats and mulch-plant soybeans; drill lupine in soybean stubble after soybeans are harvested. *Third year:* Turn under lupine and plant corn.
(3) Rotate row crops and perennial grasses or legumes, provided that row crops are not grown more than 2 years in succession.

CAPABILITY UNIT IIe–2

Capability unit IIe–2 consists of deep, well-drained, gently sloping soils on uplands. Most of the acreage has been cultivated and is eroded. In eroded areas the plow layer generally contains some subsoil material. In uneroded areas the plow layer is very friable to loose sandy loam to fine sandy loam. The subsoil is friable to extremely firm, dark-red to yellowish-brown sandy clay to sandy clay loam.

Surface runoff is medium, and further erosion is likely if these soils are not protected. Infiltration is moderately rapid, and permeability is moderate to moderately slow. These soils supply a moderate amount of moisture to plants. They are medium acid or strongly acid and generally are low in organic matter and natural fertility. Their root zone is 30 to 36 inches thick or more. They respond well to fertilization and are fairly easy to conserve. These soils are generally in good tilth, but eroded areas crust and clod if plowed when wet. They are—

Faceville fine sandy loam, 2 to 5 percent slopes, eroded.
Greenville sandy loam, 2 to 5 percent slopes.
Greenville sandy loam, 2 to 5 percent slopes, eroded.
Magnolia sandy loam, 2 to 5 percent slopes, eroded.
Tifton fine sandy loam, 2 to 5 percent slopes.
Tifton fine sandy loam, 2 to 5 percent slopes, eroded.

These soils occupy about 5 percent of the county. About 55 percent of their acreage is cultivated, 10 percent is pastured, and 35 percent is wooded. Many kinds of crops can be grown. Under good management, cotton, corn, peanuts, oats, wheat, rye, and soybeans are well suited. Crops that require only a little tillage should be used. Root crops are difficult to harvest. Well-suited legumes are sericea lespedeza, common lespedeza, crimson clover, lupine, velvetbeans, cowpeas, and crotalaria. Common bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass are well-suited grasses. Pecan trees, peach trees, truck crops, and nursery crops also grow well.

These soils should be managed in about the same way as the soils in capability unit IIe–1, except that they should be drier when they are plowed and more carefully managed to control erosion. However, under the same management, these soils produce higher yields than the soils in unit IIe–1.

To control erosion, plant, at least once in every 2 or 3 years, close-growing crops that leave much residue, or

other soil-improving crop. Fields used for row crops should be terraced and tilled on the contour. Remove excess water from crop rows and terraces through vegetated waterways (see cover picture). For good yields, apply fertilizer and lime according to the needs of the selected crop and the results of soil tests and field trials. To maintain organic matter, follow a cropping system in which crop residue is left at or near the surface and the least amount is removed.

Suitable cropping systems:

(1) *First year:* Plant corn, use shallow cultivation, and lay by early; after the corn is harvested, beat down the stalks with a stalk cutter or rotary mower and leave them on the surface. *Second year:* Plant truck crops; disk or mow the stubble after harvesting and drill in oats and rye. *Third year:* Graze or harvest the small grain, and mulch-plant soybeans; harvest the soybeans and plant lupine to increase the supply of nitrogen.

(2) *First year:* Coastal bermudagrass, grazed or cut for hay. *Second year:* Plant corn early; harvest corn and graze, or mow late in summer.

CAPABILITY UNIT IIw–1

Local alluvial land is the only mapping unit in capability unit IIw–1. It is deep, friable, moderately well drained and somewhat poorly drained land in slight depressions and draws. Slopes range from 0 to 5 percent. The surface layer varies in texture, color, and thickness according to the surface layer in adjacent soils. In most places the surface layer is dark-gray to reddish-brown loamy sand to sandy loam and is about 30 inches thick over red or yellow sandy clay or sandy clay loam.

Erosion is not a problem on this land. Infiltration is moderately rapid. Permeability and the moisture-supplying capacity are moderate. This land contains a small to medium amount of organic matter and a medium amount of plant nutrients, but it responds well to fertilization. The tilth of the plow layer is generally good.

Although it is widely distributed, Local alluvial land occupies only about 1 percent of the county. About 20 percent of its acreage is cultivated, and about 80 percent is idle or is in trees. Many kinds of crops can be grown. Because this land is in small tracts, it is generally planted to the same kinds of crops as are adjacent soils.

How this land is used and managed is determined by the use and management of adjacent land. If adjacent fields are terraced, this land may be used as a vegetated waterway to carry away excess water from terrace outlets and crop rows. To establish vegetation in these waterways, use twice the normal amounts of seed and fertilizer. Maintain the vegetation by applying lime and fertilizer regularly, and by mowing to eliminate undesirable plants.

This land is flooded frequently but stays wet for only short periods after rains. Dig ditches to divert water and to remove excess water from fields quickly. Use the same cropping system as that used on adjacent fields. This system is one of those suggested for the soils in capability unit IIe–1.

CAPABILITY UNIT IIw–2

Capability unit IIw–2 consists of deep, friable, nearly level soils on uplands or stream terraces. These soils are moderately well drained and somewhat poorly drained. Their plow layer is very friable to loose sandy loam. The subsoil is pale yellowish-brown, friable sandy clay loam to sandy clay with gray and pale-yellow mottles.

Surface runoff is slow to very slow, and erosion is not a problem on these soils. Infiltration is moderately rapid, and permeability is moderately slow. These soils supply a moderate amount of moisture to plants. They are strongly acid. They contain a medium to small amount of organic matter and are medium to low in natural fertility. These soils respond well to fertilization, are generally in good tilth, and are easy to conserve. They are—

Izagora sandy loam.
Lynchburg sandy loam, 0 to 2 percent slopes.

These soils occupy about 1.5 percent of the county. About 30 percent of the acreage is cultivated or is in pasture; about 70 percent is idle or is wooded. Many kinds of crops can be grown. Under good management, corn, oats, wheat, rye, vegetables, and soybeans produce fair yields. Well-suited grasses are common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, and dallisgrass. White clover, ladino clover, sericea lespedeza, and lupine are well-suited legumes.

If they are managed well, these soils can be cultivated intensively without losing a large amount of plant nutrients or soil material through erosion. For good yields, apply lime and fertilizer according to the needs of the selected crop as determined by soil tests. Because they are low lying and have a high water table, these soils need drainage if cultivated crops are planted. Arrange rows so that they drain off excess water, and dig ditches to carry excess water from the field. Plow fields in narrow beds that leave furrows or shallow ditches between the beds to carry off water. To maintain organic matter and improve soil structure, follow a cropping system in which cover crops are planted and all crop and plant residue is left at or near the surface.

Suitable cropping systems—

(1) *First, second, and third years:* Row crops. *Fourth year:* Small grain and summer legume.

(2) *Continuously:* Row crops with a winter legume in alternate years.

(3) *First, second, and third years:* Row crops. *Fourth and fifth years:* Sod crops.

CAPABILITY UNIT IIs–1

Capability unit IIs–1 consists of deep well-drained, gently sloping soils on uplands. These soils are sandy and somewhat droughty. Their plow layer is very friable to loose loamy sand. The subsoil of these soils is red to yellow sandy clay loam.

Surface runoff is slow, and erosion is not a problem. Infiltration and permeability are rapid, and the moisture-supplying capacity is low. These soils contain a small amount of organic matter and are low in natural fertility. Because they are somewhat droughty, these soils do not respond to fertilization so well as the soils in capability units I–1 and IIe–1. Their root zone is 36 to 60 inches thick or more. These soils are easy to till and generally are in good tilth. They are—

Norfolk loamy sand, thick surface, 2 to 5 percent slopes.
Orangeburg loamy sand, thick surface, 2 to 5 percent slopes.
Ruston loamy sand, thick surface, 2 to 5 percent slopes.

These soils occupy about 2.5 percent of the county. About 47 percent of the acreage is cultivated, 3 percent is

pastured, and 50 percent is wooded. Many kinds of crops can be grown. Under good management, cotton, corn, peanuts, and small grains are well suited. Crimson clover, sericea lespedeza, common lespedeza, crotalaria, and lupine are well-suited legumes. Well-suited grasses are common bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass. Pecan trees, truck crops, and nursery crops also grow well on these soils.

These soils can be cultivated extensively without losing large amounts of soil material through erosion. Exceptions are those places where there is uncontrolled runoff from road ditches, diversion ditches, rooftops, feedlots, and the like. In such places vegetated waterways should be provided to carry away excess water. Because they leach rapidly and the moisture-supplying capacity is low, these soils should be managed in a cropping system that will supply large amounts of organic matter. To prevent the accumulation of soil at field boundaries, alternate the direction of plowing.

Increase yields by planting, at least once in every 2 or 3 years, close-growing crops that leave much residue or plant other soil-improving crops. Apply fertilizer and lime according to the needs of the selected crop, as indicated by soil tests. Maintain organic matter by returning all crop residue to the soil.

Suitable cropping systems:

(1) *First year:* Corn. Harvest or hog down. Use normal amounts of seed and fertilizer; seed crotalaria in the corn the last time it is cultivated; after crotalaria seed has matured, beat down with a stalk cutter or rotary mower and leave the residue on the surface for a winter cover. *Second year:* Corn. Lay by early so that crotalaria may become reestablished; after crotalaria seed has matured, beat down with a rotary mower or stalk cutter, and leave the residue on the surface as winter cover.

(2) *First and second years:* Follow the same procedure as that described in the preceeding cropping system. *Third year:* Peanuts, cotton, or another row crop. Drill lupine into unplowed soil after the tilled crop has been harvested.

CAPABILITY UNIT IIIe–1

Capability unit IIIe–1 consists of well-drained, moderately eroded, gently sloping soils on uplands. The surface layer of these soils is very friable or loose loamy sand. In places the subsoil material is mixed with the surface layer. The subsoil is friable, yellow to red sandy clay loam.

Surface runoff is medium, and further erosion is likely if these soils are not protected. Infiltration is moderately rapid, and permeability is moderate. These soils supply a moderate amount of moisture to plants. They are medium acid to strongly acid, and generally contain a small amount of organic matter. They are moderate to low in natural fertility. Their root zone is 36 to 60 inches thick or more. These soils are generally in good tilth, respond well to fertilization, and are fairly easy to conserve. They are—

Norfolk loamy sand, 5 to 8 percent slopes, eroded.
Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded.
Orangeburg loamy sand, 5 to 8 percent slopes, eroded.
Red Bay loamy sand, 5 to 8 percent slopes, eroded.
Ruston loamy sand, 5 to 8 percent slopes, eroded.

The soils in this unit occupy about 8 percent of the county. About 10 percent of the acreage is cultivated, 2 percent is pastured, and 88 percent is wooded. Many kinds of crops can be grown. Under good management, cotton, corn, oats, wheat, rye, vegetables, and soybeans are well suited. Common bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass are well-suited grasses. Well-suited legumes are sericea lespedeza, common lespedeza, crimson clover, lupine, and crotalaria. Pecan trees and nursery crops also grow well.

These soils should be managed in about the same way as the soils in capability unit IIe–1, but more care is required to control erosion. Under good management, however, these soils produce good yields.

Control erosion by planting, at least twice every 3 or 4 years, close-growing crops that leave much residue or other soil-improving crops. Fields used for row crops should be terraced and tilled on the contour, or planted in alternate strips of row crops and close-growing crops. Provide vegetated waterways to remove excess water from crop rows and terraces. Apply fertilizer and lime according to the needs of the selected crop and the results of soil tests. To maintain organic matter, follow a cropping system in which the crop residue is left at or near the surface. If they are adequately fertilized, are protected by water-control structures, and are appropriately cropped, these soils can be cultivated safely and will produce good yields.

Suitable cropping systems:

(1) *First year:* Cotton. Mow cotton stubble and drill in oats. *Second year:* Graze or harvest oats; for green manure, plant cowpeas, and follow with oats. *Third year:* Graze or harvest oats, leave native cover, stubble, or both on the surface during the summer; increase supply of nitrogen by planting lupine, vetch, or Austrian winter peas. *Fourth year:* Corn. Use normal amounts of seed and fertilizer; use shallow cultivation and lay by early; after harvest, beat down stalks with a stalk cutter or rotary mower and allow the residue to cover the soil through the winter.

(2) *First year:* Corn. After harvest, beat down the stalks with a stalk cutter or rotary mower and leave the residue on the soil for a winter cover. *Second year:* Corn followed by lupine for green manure. *Third year:* Plow under the lupine and establish a perennial sod of bahiagrass or Coastal bermudagrass. *Fourth and fifth years:* Perennial sod.

CAPABILITY UNIT IIIe–2

Capability unit IIIe–2 consists of deep, well-drained, gently sloping soils on uplands. Most of the acreage has been cultivated and eroded. In eroded areas the plow layer contains some subsoil material. The subsoil is yellowish-brown to dark-red, friable to firm sandy clay to sandy clay loam.

Surface runoff is medium, and further erosion is likely if these soils are not protected. Infiltration is moderately rapid, and permeability is moderate to moderately slow. These soils supply a moderate amount of moisture to plants. They are medium acid or strongly acid, generally contain a small amount of organic matter, and are moderate in natural fertility. Their root zone is 36 to 60 inches

Figure 7.—**Coastal bermudagrass grown for hay on Greenville sandy loam, 5 to 8 percent slopes, eroded. Class III land.**

thick or more. These soils respond well to fertilization and generally are in good tilth. They can be tilled within only a narrow range of moisture content, and they crust and clod when plowed wet. They are—

Faceville fine sandy loam, 5 to 8 percent slopes, eroded.
Greenville sandy loam, 5 to 8 percent slopes, eroded.
Magnolia sandy loam, 5 to 8 percent slopes, eroded.
Tifton fine sandy loam, 5 to 8 percent slopes, eroded.

These soils occupy about 1 percent of the county. About 10 percent of the acreage is cultivated, 15 percent is pastured, and 75 percent is wooded or is idle. Many kinds of crops can be grown.

Under good management, corn, cotton, peanuts, oats, wheat, rye, vegetables, and soybeans are well suited. Because the surface soil puddles and crusts, crops that require only a little tillage should be chosen. Root crops are difficult to harvest. Well-suited legumes are sericea lespedeza, common lespedeza, crimson clover, lupine, velvetbeans, cowpeas, and crotalaria. Common bermudagrass, Coastal bermudagrass (fig. 7), and Pensacola bahiagrass are well-suited grasses. Peach trees, pecan trees, and nursery crops also grow well.

These soils should be managed in about the same way as the soils in capability unit IIIe–1, but they should be drier when tilled and more carefully managed to control erosion. Plowing when wet, especially in eroded spots, encourages puddling and crusting of the surface soil; the stand of crops in such places is likely to be incomplete. These soils generally produce good yields under good management.

Control erosion by planting, at least twice in every 3 or 4 years, close-growing crops that leave much residue or some other soil-improving crop. Fields used for row crops should be terraced and tilled on the contour or planted in alternate strips of row crops and close-growing crops. Remove excess water from crop rows and terraces through vegetated waterways. For good yields, apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. To maintain organic matter, follow a cropping system in which the crop residue is left at or near the surface. These soils can be kept highly productive by applying fertilizer as needed and by using water-control structures and good cropping systems. A good system of water-control structures is shown in figure 8.

Suitable cropping systems:

(1) *First year:* Corn. After harvest, beat down stalks with a stalk cutter or rotary mower and leave them on the surface. *Second year:* Corn followed by lupine to increase the supply of nitrogen. *Third year:* Plow under lupine early in the spring, and plant bahiagrass or Coastal bermudagrass for a perennial sod. *Fourth and fifth years:* Perennial sod.

(2) *First year:* Cotton. Disk or mow stubble and drill in oats. *Second year:* Graze or harvest oats; plant cowpeas; plow under cowpeas early in the fall and drill in oats. *Third year:* Graze or harvest oats; leave stubble, native cover, or both on the surface all summer, and, to increase the supply of nitrogen, plant lupine, vetch, or winter peas. *Fourth year:* Plant corn, use shallow cultivation, and lay by early; after the corn is harvested, beat down the stalks with a stalk cutter or rotary mower and leave them on the surface.

CAPABILITY UNIT IIIe–5

Capability unit IIIe–5 consists of deep, well-drained, gently sloping soils on uplands. The plow layer is very friable or loose loamy sand. The subsoil is friable, red to yellow sandy loam or sandy clay loam.

Surface runoff is slow to medium, and erosion is not a serious problem, except in places where water accumulates and runs off rapidly. Infiltration is rapid, and permeability is rapid to moderate. The moisture-supplying capacity is low. These soils are low in natural fertility and contain little organic matter. Because they are droughty, they do not respond to fertilization so well as the soils in

Figure 8.—**Parallel terraces and sod waterways are effective in reducing runoff and erosion in this field of corn. Class II and class III land.**

capability unit IIIe–1. Their root zone is 36 to 60 inches thick or more. These soils are generally in good tilth and are easy to conserve. They are—

Norfolk loamy sand, thick surface, 5 to 8 percent slopes.
Orangeburg loamy sand, thick surface, 5 to 8 percent slopes.
Ruston loamy sand, thick surface, 5 to 8 percent slopes.

These soils occupy about 0.3 percent of the county. About 2 percent of the acreage is cultivated, and 98 percent is idle or is in trees. A fairly large variety of crops can be grown. If appropriately managed, cotton, corn, peanuts, small grains, soybeans, cowpeas, and velvetbeans are well suited. Sericea lespedeza, common lespedeza, crimson clover, crotalaria, and lupine are well-suited legumes. Well-suited grasses are common bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass. Pecan trees and nursery crops grow fairly well.

These soils can be cultivated without losing large amounts of soil material through erosion. Exceptions to this are places where there is uncontrolled runoff from road ditches, diversion ditches, rooftops, feedlots, and the like. In these places, vegetated waterways should be provided to carry away accumulated water.

Because they leach rapidly and have a low moisture-supplying capacity, these soils should be managed in a cropping system that supplies large amounts of organic matter. Increase the supply of organic matter and help control erosion by planting, at least twice in every 3 or 4 years, close-growing crops that leave much residue or some other soil-improving crop. Apply fertilizer and lime according to the needs of the selected crop and the results of soil tests. Leave crop residue at or near the surface.

Suitable cropping systems:

(1) *First year:* Corn. Use shallow cultivation and lay by early. After harvest, beat down the stalks with a stalk cutter or rotary mower, and leave them on the surface. *Second and third years:* Coastal bermudagrass for grazing or for hay.
(2) *First year:* Coastal bermudagrass. *Second year:* Corn. Use shallow cultivation and lay by early to allow the bermudagrass to become reestablished. *Third year:* Coastal bermudagrass.

CAPABILITY UNIT IIIw-2

Grady sandy loam is the only soil in capability unit IIIw–2. It is a deep, poorly drained, nearly level soil that occurs in sinks or saucerlike depressions. The surface layer is very friable sandy loam. The subsoil is firm, light-gray to gray sandy clay.

Surface runoff is very slow on this soil, and erosion is not a problem. Infiltration and permeability are slow to very slow. The moisture-supplying capacity is moderate to high. This soil is strongly acid and contains a medium amount of organic matter. It is moderate to low in natural fertility but, if adequately drained, responds well to fertilization. Tilth is generally good.

Although this soil is widely distributed, it occupies only about 0.3 percent of the county. Except for a few fields that are in pasture, all of this soil is wooded. Few kinds of crops can be grown. In drained areas corn is fairly well suited. Bahiagrass, common bermudagrass, and dallisgrass are well-suited grasses. Well-suited legumes are white clover, ladino clover, cowpeas, and lupine. Truck crops also grow well.

Because it is in small, low-lying areas, Grady sandy loam is generally difficult to drain. To drain it effectively, dig a large main ditch to carry excess water from the area. Dig small lateral ditches to carry surface water rapidly into the main ditch. Because water moves very slowly through the subsoil, drainage through underground tile is not effective.

If it is drained and otherwise well managed, this soil can be cultivated without losing a large amount of soil material or plant nutritients through erosion. For good yields, apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. Arrange rows so that excess water is drained from the field. Plow fields in narrow beds that have furrows or shallow ditches between them to carry away water. To maintain organic matter, follow a cropping system in which crop residue is left at or near the surface. Use cropping systems like those used on the soils of capability unit IIw–2.

Suitable cropping systems:

(1) *Continuously:* Row crops with a winter legume in alternate years.
(2) *First, second, and third years:* Row crops. *Fourth year:* Small grain and a summer legume.
(3) *First, second, and third years:* Row crops. *Fourth and fifth years:* Sod crops of bahiagrass or other perennial grass.

CAPABILITY UNIT IIIw-3

Chewacla silt loam is the only soil in capability unit IIIw–3. It is a deep, somewhat poorly drained or moderately well drained, nearly level soil on flood plains. The surface layer is very friable silt loam. The subsoil is friable to firm silt loam to silty clay mottled with gray and pale gray.

Surface runoff is very slow on this soil, and erosion is not a problem. Permeability is moderate to slow, and the moisture-supplying capacity is high. This soil is strongly acid. It contains a medium to low amount of organic matter and is medium to low in natural fertility. Because the water table is high, the root zone of this soil is only about 26 inches thick. Tilth is generally good, and the soil is easy to conserve.

This soil occupies about 4 percent of the county. Because it floods frequently, is poorly drained, and is not easily accessible, this soil is not cultivated. All of the acreage is wooded. If it is cleared, this soil can be used for many kinds of crops. Corn, grain sorghum, bahiagrass, whiteclover, vetch, dallisgrass, and Caley peas are well suited.

If it is drained and protected from flooding, Chewacla silt loam can be cultivated intensively without losing large amounts of soil material and plant nutrients through erosion. Plant close-growing crops or other soil-improving crops occasionally to maintain organic matter and to improve soil structure and tilth. Follow a cropping system in which crop residue is left at or near the surface. For good yields, apply lime and fertilizer according to the needs of the selected crop and the results of soil tests.

Except for those that include small grains, cropping systems like those suggested for the soils in capability unit IIIw–2 are suitable. Another suitable cropping system is—

First, second, and third years: Corn. *Fourth and fifth years:* Bahiagrass.

CAPABILITY UNIT IIIw–5

Capability unit IIIw–5 consists of deep, somewhat poorly drained and moderately well drained, nearly level and gently sloping soils on terraces. The surface layer of these soils is very friable loamy sand. The subsoil is friable to firm fine sandy clay to clay mottled with yellowish brown.

Surface runoff is slow on these soils, and erosion is not a problem. Infiltration is rapid. Permeability is moderately slow to slow, and the moisture-supplying capacity is moderate. These soils are strongly acid, contain a small amount of organic matter, and are low in natural fertility. They are generally in good tilth and are easy to conserve. They are—

Wahee loamy sand.
Wahee loamy sand, thick surface.

These soils occupy about 1 percent of the county. About 10 percent of the acreage is cultivated or is in pasture, and 90 percent is idle or is in trees. A fairly wide variety of crops can be grown. Corn, oats, wheat, rye, truck crops, and soybeans are fairly well suited. Common bermudagrass, bahiagrass, dallisgrass, and ryegrass are well-suited grasses. Well-suited legumes are white clover, ladino clover, sericea lespedeza, and lupine.

Under good management, these soils can be intensively cultivated without losing large amounts of soil material through erosion. Remove surface water through a main ditch and several lateral ditches. Arrange crop rows so that they drain excess water into collection ditches. Plow fields in narrow beds that leave furrows or shallow ditches between the beds to carry off excess water.

Increase yields by planting, at least once in every 2 or 3 years, close-growing crops that leave much residue or some other kind of soil-improving crops. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. To maintain organic matter and a good soil structure, follow a cropping system in which the crop residue is left at or near the surface and the least amount of it is removed.

Suitable cropping systems:

(1) *First year:* Corn. Use shallow planting and lay by early; after harvest, cut the stalks with a rotary mower or stalk cutter and drill in oats. *Second year:* Graze or harvest oats and mulch-plant soybeans in stubble. *Third year:* Corn. Harvest corn and plant lupine for a green-manure crop.

(2) *First year:* Corn. After harvest, beat down stalks with a stalk cutter or rotary mower and leave them for a winter cover. *Second year:* Corn planted in disked or ripped stubble and laid by early; after harvest, cut or beat down stalks and leave for a winter cover. *Third and fourth years:* Bahiagrass for seed, for pasture, or for hay.

CAPABILITY UNIT IIIs–1

Capability unit IIIs–1 consists of well-drained and somewhat excessively drained, nearly level and gently sloping sandy soils of the uplands that are droughty and very deep. The plow layer is loose loamy sand, and the subsoil is yellow to red, friable sandy clay loam to loamy sand.

Surface runoff is slow on these soils, and erosion is not a problem. Infiltration and permeability are rapid to very rapid. The moisture-supplying capacity and natural fertility are low, and the amount of organic matter is small. These soils have a root zone that is 36 to 60 inches thick or more. They are generally in good tilth and are easy to conserve. They are—

Americus loamy sand, 2 to 5 percent slopes.
Eustis loamy sand, shallow, 0 to 5 percent slopes.
Lakeland loamy sands, shallow, 2 to 5 percent slopes.

These soils occupy about 2 percent of the county. About 35 percent of the acreage is cultivated, and 65 percent is idle or is in trees. Many kinds of crops can be grown. Corn, cotton, peanuts, small grains, and soybeans are well suited. Common bermudagrass, Coastal bermudagrass, and bahiagrass are well-suited grasses. Well-suited legumes are crotalaria, lupine, sericea lespedeza, common lespedeza, cowpeas, and velvetbeans.

These soils can be cultivated without losing large amounts of soil material through erosion. Exceptions are those places where there is uncontrolled runoff from road ditches, rooftops, feedlots, and the like. In these places, vegetated waterways should be provided to carry away accumulated water.

Because they leach rapidly and their moisture-supplying capacity is low, these soils should be managed in a cropping system that keeps them in a perennial grass or a legume much of the time, or in other crops that supply large amounts of crop residue. Increase the supply of organic matter by planting, at least twice in every 3 or 4 years, close-growing crops that leave much residue or some other kind of soil-improving crop. To offset rapid leaching, apply fertilizer in split applications. Use farm manure, fertilizer, and lime according to the needs of the selected crop and the results of field trials and soil tests.

Suitable cropping systems:

(1) *First year:* Corn or cotton. After harvest, cut or beat down the stalks and leave them for a winter cover. *Second year:* Corn or cotton planted in the residue from the preceding crop. *Third and fourth years:* Coastal bermudagrass or bahiagrass.

(2) *First year:* Row crops. *Second and third years or more:* Perennial sod of Coastal bermudagrass or bahiagrass.

CAPABILITY UNIT IVe–1

Capability unit IVe–1 consists of deep, well-drained, gently sloping to strongly sloping soils on uplands. The surface layer of these soils is 1 to 4 inches of loose or very friable loamy sand. In more severely eroded areas, the friable sandy clay loam subsoil is exposed.

Surface runoff is rapid, and further erosion is likely if these soils are not protected. Infiltration is moderately rapid. Permeability and the moisture-supplying capacity are moderate. Natural fertility is moderate to low, and the content of organic matter is medium to small. Except in severely eroded places, these soils generally are

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in good tilth; but they are difficult to conserve. They respond well to fertilization. They are—

Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded.
Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded.
Orangeburg loamy sand, 8 to 12 percent slopes, eroded.
Red Bay loamy sand, 8 to 12 percent slopes, eroded.

These soils occupy about 6 percent of the county. About 10 percent is cultivated or is in pasture; about 90 percent is idle or is in trees. Under good management, many kinds of crops can be grown. Cotton, corn, peanuts, oats, wheat, rye, and soybeans are well suited. Common bermudagrass, Coastal bermudagrass, and bahiagrass are well-suited grasses. Well-suited legumes are crimson clover, sericea lespedeza, and common lespedeza.

If careful management is used to control erosion, these soils can be cultivated occasionally. However, they are better suited to pasture and to hay crops.

Keep these soils in deep-rooted, perennial crops 3 out of every 4 or 5 years because these crops leave much residue and help to control erosion. Fields used for row crops should be terraced and tilled on the contour. Farm fences and roads should run along the contour or the top of ridges where terraces are divided. Remove excess water from crop rows and terraces through vegetated waterways. For good yields, apply lime and fertilizer according to the needs of the selected crop and results of soil tests. To maintain organic matter and a good soil structure, follow a cropping system in which the crop residue is left at or near the surface. If they are adequately fertilized, protected by water-control structures, and appropriately cropped, these soils can be kept highly productive.

Suitable cropping systems:

(1) *First year:* Cotton or corn. After harvest, cut or mow the stalks and leave for a winter cover. *Second year:* Coastal bermudagrass. Establish and graze or cut for hay. *Third, fourth, and fifth years:* Graze or cut bermudagrass for hay.

(2) *First, second, and third years:* Sod. *Fourth year:* Corn, planted in the sod with sod between rows left undisturbed.

CAPABILITY UNIT IVe-2

Greenville sandy loam, 8 to 12 percent slopes, eroded, is the only soil in capability unit IVe–2. It is a deep, well-drained, strongly sloping soil on uplands. The surface layer is 2 to 4 inches of very friable sandy loam. In severely eroded places, the dark-red, friable to firm sandy clay subsoil is exposed.

Surface runoff is rapid, and further erosion is likely if this soil is not protected. Infiltration is moderate to moderately rapid, and permeability is moderate to moderately slow. The moisture-supplying capacity and natural fertility are moderate. This soil contains a small amount of organic matter and is strongly acid. It is generally in fair tilth. It responds fairly well to fertilization but is difficult to conserve.

This soil occupies only about 0.1 percent of the county, and all the acreage is wooded. Under good management, many kinds of crops can be grown. Cotton, corn, peanuts, small grains, and soybeans are well suited. Common bermudagrass, Coastal bermudagrass, and bahiagrass are well-suited grasses. Well-suited legumes are crimson clover, sericea lespedeza, common lespedeza, and lupine.

If careful management is applied to control erosion, this soil can be cultivated occasionally. However, it is better suited to pasture and to hay than to cultivated crops.

This soil should be kept in deep-rooted, perennial crops 3 out of every 4 or 5 years. These crops leave much residue and help to control erosion. Fields used for row crops should be terraced and tilled on the contour. Farm fences and roads should run along the contour or on the tops of ridges where terraces are divided. Remove excess water from crop rows and terraces through vegetated waterways. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. To maintain organic matter and good soil structure, follow a cropping system in which the crop residue is kept at or near the surface. If it is adequately fertilized, protected by water-control structures, and appropriately cropped, this soil can be kept fairly productive.

Suitable cropping system:

First year: Corn. After harvest, cut or mow stalks and leave them for a winter cover. *Second, third, and fourth years:* Coastal bermudagrass grazed or cut for hay.

CAPABILITY UNIT IVe-4

Capability unit IVe–4 consists of gently sloping soils that have varied characteristics and are on uplands. The surface layer ranges from clay to sand. In many places, especially in more eroded areas, clay is only a few inches from the surface. In many spots, however, the sand is several feet thick over the clayey materials. Galled spots are common, and there are a few gullies.

Surface runoff is moderate to rapid, and further erosion is likely if these soils are not protected. Infiltration is very slow to moderately rapid, and permeability is moderate to slow. The moisture-supplying capacity, natural fertility, and content of organic matter are low. The reaction is strongly acid. Roots penetrate to a depth of 18 to 36 inches or more. These soils are generally in good tilth and respond fairly well to fertilization, but they are difficult to conserve. They are—

Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded.
Sandy and clayey land, gently sloping, eroded.

The soils occupy about 4 percent of the county. About 6 percent of the acreage is cultivated or is in pasture; 94 percent is wooded or is idle. Under good management, many kinds of crops can be grown. Corn, cotton, small grains, and soybeans do well. Common bermudagrass, Coastal bermudagrass, and bahiagrass are well-suited grasses. Well-suited legumes are crimson clover, sericea lespedeza, common lespedeza, and lupine.

If the soils in this unit are carefully managed to control erosion, they can be cultivated occasionally. However, they are better suited to pasture or trees than to cultivated crops.

Keep these soils in deep-rooted, perennial crops 3 out of every 4 or 5 years; these are crops that leave much residue and help to control erosion. Fields used for row crops should be terraced and tilled on the contour. Farm fences and roads should run along the contour or on the tops of ridges where terraces are divided. Remove excess water from crop rows and terraces through vegetated water-

ways. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. Follow a cropping system in which all crop residue is left on the land.

Suitable cropping system:

First year: Cotton. After harvest, cut or mow stalks and leave them for winter cover. *Second, third, and fourth years:* Bahiagrass, grazed or cut for hay.

CAPABILITY UNIT IVw–1

Wehadkee silty clay loam is the only soil in capability unit IVw–1. It is a deep, poorly drained, nearly level soil on flood plains. The surface layer is 6 to 8 inches of friable silty clay loam. The subsoil is light-gray silty clay loam that is mottled and is slightly sticky when wet.

Surface runoff is very slow on this soil. Erosion is not a problem, but floods are frequent. Permeability is very slow, and the moisture-supplying capacity is high. This soil contains a medium to large amount of organic matter and is very strongly acid. The natural fertility is low. This soil is generally in fair tilth, responds fairly well to fertilization, and is easy to conserve.

This soil occupies only about 0.1 percent of the county. All the acreage is in trees. Few crops can be grown. Corn is only moderately well suited, and other cultivated crops are not suited. Well-suited grasses and legumes are bahiagrass, dallisgrass, ryegrass, fescue, whiteclover, and vetch. Because it is frequently flooded and is inaccessible, this soil is not cultivated.

If it is cleared and adequately drained, this soil can be cultivated occasionally. However, it is better suited to pasture or to trees.

If corn or another field crop is grown, plow fields in narrow beds that have furrows or shallow ditches between them to carry away water. Arrange rows so that they drain water into the ditches. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. To help maintain organic matter and a good soil structure, occasionally use close-growing crops that leave much residue or use other soil-improving crops.

Suitable cropping system:

First year: Corn. *Second year:* Corn. *Third, fourth, and fifth years:* Bahiagrass for pasture or hay.

CAPABILITY UNIT IVs–1

Capability unit IVs–1 consists of deep or very deep, excessively drained, nearly level to strongly sloping soils on uplands and terraces. These soils are very sandy and droughty. The plow layer is loose loamy sand to sand. The subsoil is sandy but is underlain at 30 to 60 inches by finer, more friable sediments.

Surface runoff is slow on these soils, and erosion is not a problem. Infiltration and permeability are rapid to very rapid. The moisture-supplying capacity is low. These soils contain a small amount of organic matter, are low in natural fertility, and are strongly acid. They are generally in good tilth and are easy to conserve, but yields are only fair. The soils are—

Eustis loamy sand, shallow, 5 to 8 percent slopes.
Eustis sand, 2 to 5 percent slopes.
Eustis sand, 5 to 8 percent slopes.
Eustis sand, terrace.
Lakeland sand, terrace.
Lakeland loamy sands, shallow, 5 to 8 percent slopes.
Lakeland sands, 0 to 5 percent slopes.
Lakeland sands, 5 to 8 percent slopes.

These soils occupy about 7 percent of the county. About 15 percent of the acreage is cultivated, and 85 percent is idle or is in trees. Under good management, many kinds of crops can be grown. Corn, peanuts, small grains, and soybeans grow well. Common bermudagrass, Coastal bermudagrass, and bahiagrass are well-suited grasses. Well-suited legumes are sericea lespedeza, common lespedeza, lupine, and crotalaria.

If careful management is used to conserve organic matter and moisture, these soils can be cultivated. They are not suitable for terracing. Maintain organic matter by planting, at least 3 out of every 4 years, close-growing crops that leave much residue, or keep the soils in perennial grasses and legumes much of the time. Plant row crops on the contour in strips that alternate with strips of close-growing crops. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. To offset rapid leaching, apply fertilizer in split applications.

Suitable cropping system:

First year: Plant corn and lay by early; after harvest, cut or mow stalks and native vegetation, and leave them on the surface. *Second year:* Coastal bermudagrass or bahiagrass; seed early in spring in disked or ripped corn stubble. *Third and fourth years:* Perennial sod.

CAPABILITY UNIT Vw–2

Capability unit Vw–2 consists of deep, poorly drained, nearly level land that has washed into drainageways from adjacent uplands. The surface layer is stratified and varies greatly in texture and color. It is very strongly acid. The underlying material is highly mottled, gray sandy clay or sandy clay loam.

Surface runoff is very slow, and erosion is not a problem. Infiltration and permeability are retarded by a water table that is at or above the surface much of the time. Some areas of this land are frequently flooded. The moisture-supplying capacity is moderate to high. The content of organic matter varies greatly but is generally high. These land types are generally in good tilth and are easy to conserve. They are—

Local alluvial land, wet.
Wet alluvial land.

This land makes up about 11 percent of the county. All the acreage is wooded, mostly with hardwoods. It is not suited to cultivated crops. If this land is cleared, drained, and managed so as to control water, it can be used for pasture. Bahiagrass, dallisgrass, tall fescue, and whiteclover are moderately well suited pasture plants. Apply lime and fertilizer according to the needs of the crop selected and the results of soil tests.

This land is probably best suited to trees. Slash and loblolly pines are more desirable than hardwoods and could be produced if stream channels were cleared and drained. This would also help natural restocking of desired trees.

Most of the farm ponds in the county are on this land.

Figure 9.—**Pasture of Pensacola bahiagrass on Greenville clay loam, 8 to 12 percent slopes, severely eroded. Class VI land.**

CAPABILITY UNIT VIe–1

Capability unit VIe–1 consists of deep, well-drained, sloping and strongly sloping soils on uplands. These soils are moderately to severely eroded and are gullied with many shallow and a few deep gullies. The surface layer is very friable to friable loamy sand to clay loam. The subsoil is red to dark-red, friable or firm sandy clay loam to sandy clay.

Surface runoff is rapid to very rapid, and further erosion is very likely. Infiltration and permeability are moderate to moderately slow. The moisture-supplying capacity is moderate to low. These soils contain a small amount of organic matter and are medium acid or strongly acid. Their root zone is 36 to 60 inches thick or more. Natural fertility of these soils is moderate to low, but response to fertilization is good. These soils are generally in good tilth but are difficut to conserve. They are—

Greenville clay loam, 8 to 12 percent slopes, severely eroded.
Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded.
Orangeburg loamy sand, 12 to 17 percent slopes, eroded.

These soils make up about 6 percent of the county. About 97 percent of the acreage is wooded, and 3 percent is idle. These soils are not suited to cultivated crops. Fair to medium pasture can be established and maintained, but if these soils are not needed for pasture, they should be kept in trees. Common bermudagrass, Coastal bermudagrass, and bahiagrass (fig. 9) are fairly well suited pasture grasses. Legumes that grow fairly well are sericea lespedeza, common lespedeza, crimson clover, lupine, and cowpeas. Well-suited trees are shortleaf and loblolly pines. If used for pasture, these soils generally are best suited to perennial plants. All tillage should be on the contour, but the soils should be tilled only to establish new seedings. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. Control grazing carefully.

CAPABILITY UNIT VIe–2

Capability unit VIe–2 consists of nearly level to strongly sloping, moderately eroded soils and land types on uplands. The surface layer of these soils varies greatly in texture and in thickness. In some places sand is several feet thick over clay, and in other places the clayey material is only a few inches below the surface.

These soils have rapid to moderate surface runoff and are susceptible to further erosion if they are not protected. Infiltration is moderately rapid to moderately slow. Permeability is very slow to moderate, and the moisture-supplying capacity ranges from moderate to low. The reaction is strongly acid. The content of organic matter is low, and tilth varies from good to poor. The root zone is 10 to 36 inches thick or more. These soils are low in natural fertility, but they respond fairly well to fertilization. They are—

Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded.
Sandy and clayey land, sloping, eroded.
Susquehanna sandy loam, 2 to 8 percent slopes, eroded.

These soils occupy about 9 percent of the county and are all wooded. They are not suited to cultivated crops. Fair to medium pasture can be established and maintained, but if pasture is not needed, the soils should be kept in trees. Common bermudagrass, bahiagrass, sericea lespedeza, common lespedeza, and kudzu are moderately well suited pasture plants. Well-suited trees are shortleaf and loblolly pines.

Except on gentle slopes, till only on the contour and only to establish new seedings. Apply lime and fertilizer according to the needs of the selected crop and the results of soil tests. Control grazing carefully.

CAPABILITY UNIT VIe–3

Binnsville clay, 2 to 8 percent slopes, eroded, is the only soil in capability unit VIe–3. This soil is on uplands and is moderately well drained, gently sloping, and alkaline. The surface layer is 2 to 6 inches of very firm clay that is underlain by pale-yellow to white marl.

Surface runoff is very rapid, and further erosion is likely if this soil is not protected. Infiltration and permeability are slow to very slow. The moisture-supplying capacity is low. This soil contains a medium to small amount of organic matter and is medium to low in natural fertility.

This soil makes up about 0.2 percent of the county. All the acreage is wooded. The soil is not suited to cultivated crops. Fair to medium pasture can be established and maintained, but if pasture is not needed, the soil should be kept in trees. Use pasture plants that tolerate a highly alkaline subsoil, and carefully control grazing. Shortleaf and loblolly pines are fairly well suited trees.

CAPABILITY UNIT VIs–1

Capability unit VIs–1 consists of very deep, somewhat excessively drained, strongly sloping soils on uplands. These soils are sandy and strongly acid. The upper part of the solum is 40 to 60 inches or more of loose sand, which is over friable, yellow to reddish-brown sandy loam to sandy clay loam.

Surface runoff is slow to very slow on these soils, and erosion is not a serious problem. Infiltration and permeability are very rapid. The moisture-supplying capacity is very low. These soils contain a small amount of organic matter and are low in natural fertility. They are generally in good tilth, are easy to conserve, but respond only fairly well to fertilization. They are—

Eustis sand, 8 to 12 percent slopes.
Lakeland sands, 8 to 12 percent slopes.

These soils occupy about 1 percent of the county. All of this acreage is wooded. The soils are not suited to cultivated crops. Fair to medium pasture of deep-rooted plants can be established and maintained, but if these soils are not needed for pasture, they should be kept in trees. Best suited trees are longleaf, slash, or loblolly pines. Till only on the contour and only to establish new seedings. Logging roads, firebreaks, and all forestry operations should be on the contour. Control grazing carefully.

CAPABILITY UNIT VIIe–1

Capability unit VIIe–1 consists of deep, well-drained, strongly sloping to steep soils on uplands. These soils are severely eroded and are strongly acid. The surface layer is 2 to 3 inches of very friable or friable sandy loam or clay loam; it overlies red to dark-red, friable or firm sandy clay loam to sandy clay. In severely eroded areas, the subsoil is exposed and there are many shallow gullies and an occasional deep one.

Surface runoff is rapid to very rapid, and further erosion is very likely. Infiltration and permeability are moderately slow to moderate. The moisture-supplying capacity is moderate to low. These soils contain a small amount of organic matter and are low in natural fertility. They are generally in good tilth but are difficult to conserve. The soils are—

Greenville clay loam, 12 to 17 percent slopes, severely eroded.
Greenville clay loam, 17 to 30 percent slopes, severely eroded.
Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded.
Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded.

These soils occupy about 6 percent of the county. About 98 percent of the acreage is wooded, and 2 percent is idle. Because they are steep and highly susceptible to erosion, these soils are probably best suited to trees. Fair pasture of common bermudagrass, bahiagrass, sericea lespedeza, common lespedeza, or kudzu can be established and maintained, but if these soils are not needed for pasture, they should be kept in trees. Well-suited trees are slash, loblolly, and shortleaf pines. All tillage, logging roads, firebreaks, and forestry operations should be on the contour.

CAPABILITY UNIT VIIe–2

Capability unit VIIe–2 consists of moderately eroded to severely eroded, nearly level to steep soils and land types on uplands. The surface layer is 2 to 5 inches of loose, friable to firm sand to sandy clay loam. It is underlain by sandy or clayey material that is highly mottled with grayish white, light grayish brown, and reddish brown.

Surface runoff is rapid to very rapid, and further erosion is very likely. Infiltration and permeability are very slow, and the moisture-supplying capacity is high. The root zone is 6 to 36 inches thick. These soils contain a small amount of organic matter. They are—

Sands over kaolinitic deposits.
Sandy and clayey land, strongly sloping, severely eroded.
Susquehanna sandy loam, 8 to 17 percent slopes, eroded.
Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded.
Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded.

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These soils occupy about 6 percent of the county. All this acreage is wooded. Because they are steep and highly susceptible to erosion, these soils are best suited to trees. Well-suited trees are loblolly, slash, and shortleaf pines. To establish new stands of trees, plant seedlings on the contour. Logging roads, firebreaks, and forestry operations should be on the contour to help control erosion.

CAPABILITY UNIT VIIe–3

Capability unit VIIe–3 consists of only Gullied land. Although this land is fairly well distributed throughout the county, its total acreage is small. It consists of a net of large and small, deep and very deep gullies that are interspersed with remnants of the original soil. This land would be difficult to reclaim for crops or pasture.

This land is not suited to crops or pasture. It may, however, be used for recreation or for wildlife habitats. Some areas have reforested naturally, and all other areas can be reforested. Kudzu has been seeded in some places. This vegetation helps to slow runoff and to control further loss of soil material.

All areas should be kept in vegetation. Any kind is satisfactory, but trees should be planted where practical. To further help in stabilizing the gullies, use one or more of these practices: Remove excess water from these areas through vegetated waterways; reduce runoff with diversion ditches and terraces in adjacent fields; and plant close-growing vegetation around the heads of the gullies. Debris basins or other structures may be necessary to protect streams and lakes from silt.

CAPABILITY UNIT VIIw–1

Capability unit VIIw–1 consists only of Swamp. This land type is poorly drained and strongly acid. It is on first bottoms along large streams and is frequently flooded for long periods. Swamp contains a large amount of organic matter.

This land occupies about 2 percent of the county. All the acreage is wooded. It is not suited to cultivated crops. It is best suited as woodland and as a habitat for wildlife. Before reclamation or other use for this land is planned, a soil scientist or an engineer should be consulted.

Estimated yields

Estimated yields of the principal crops and gains in beef per acre in Twiggs County are listed in table 5 under two levels of management. In columns A are estimates of yields under the management that prevails in the county; in columns B are estimates under the best practical management.

The estimates are based on (1) observations made during the survey; (2) records of farmers; and (3) experiments made by experiment stations. It is assumed that rainfall is normal for a long period and that the soils are not irrigated. Estimates are not given if a specified soil is not suited to the principal crop or is not generally used for it.

To obtain the yields listed in columns B, a farmer should use practices suggested for each capability unit. He should also—

1. Prepare the seedbed adequately.
2. Plant or seed by suitable methods, at suitable rates, and at appropriate times.

TABLE 5.—*Estimated average acre yields of principal crops and annual gains in beef per acre of pasture under two levels of management*

[Yields in columns A are expected under prevailing management; yields in columns B are expected under best practical management but without irrigation. Absence of yield indicates crop is not suited to the soil specified or is not commonly grown on it]

Soils	Cotton (lint)		Corn		Peanuts		Oats		Coastal bermudagrass				Bahiagrass			
									Pasture		Hay		Pasture		Hay	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Lbs.	*Lbs.*	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Lb. of beef*	*Lb. of beef*	*Tons*	*Tons*	*Lb. of beef*	*Lb. of beef*	*Tons*	*Tons*
Americus loamy sand, 2 to 5 percent slopes	150	300	20	60	700	1, 800	18	45	125	350	3	5	150	325	4	6
Binnsville clay, 2 to 8 percent slopes, eroded																
Chewacla silt loam			40	75												
Eustis loamy sand, shallow, 0 to 5 percent slopes	150	300	20	60	700	1, 800	18	45	125	375	3	5	150	325	4	6
Eustis loamy sand, shallow, 5 to 8 percent slopes	100	250	15	50	500	1, 500	15	35	100	300	2	4	125	300	3	5
Eustis sand, 2 to 5 percent slopes	100	250	10	25	500	1, 000	15	30	100	200	2	4	125	250	2	4
Eustis sand, 5 to 8 percent slopes	75	200	8	20	300	800	10	20	100	200	2	4	125	250	2	4
Eustis sand, 8 to 12 percent slopes	65	175	6	15	250	700	8	18	85	150	1	3	100	225	1	3
Eustis sand, terrace	100	250	10	25	500	1, 000	15	30	100	200	2	4	125	250	2	4
Faceville fine sandy loam, 2 to 5 percent slopes, eroded	200	450	25	70	600	1, 800	20	50	175	550	2. 5	7	175	500	2	6
Faceville fine sandy loam, 5 to 8 percent slopes, eroded	125	300	12	40	400	1, 200	15	25	150	500	2	6	150	450	1. 5	5
Grady sandy loam			15	40			12	30					175	425	2	5. 5
Greenville sandy loam, 0 to 2 percent slopes	300	600	30	75	750	2, 200	40	80	200	600	3	8	200	550	3	7
Greenville sandy loam, 2 to 5 percent slopes	300	600	30	75	750	2, 200	40	80	200	600	3	8	200	550	3	7
Greenville sandy loam, 2 to 5 percent slopes, eroded	200	450	25	70	600	1, 800	30	60	175	550	2. 5	7	175	500	2	6
Greenville sandy loam, 5 to 8 percent slopes, eroded	125	300	12	40	400	1, 200	20	40	175	550	2. 5	7	175	500	2	6
Greenville sandy loam, 8 to 12 percent slopes, eroded	100	250	10	30	300	1, 000	10	20	150	500	2	5	125	400	1	4
Greenville clay loam, 8 to 12 percent slopes, severely eroded							8	15	100	300	1	3	100	250	1	2
Greenville clay loam, 12 to 17 percent slopes, severely eroded																
Greenville clay loam, 17 to 30 percent slopes, severely eroded																
Gullied land																
Izagora sandy loam	150	250	20	60	400	1, 000	15	45	125	500	3	7	150	400	2. 5	6
Lakeland loamy sands, shallow, 2 to 5 percent slopes	150	300	20	60	700	1, 800	18	45	125	350	3	5	150	325	4	6
Lakeland loamy sands, shallow, 5 to 8 percent slopes	100	250	15	50	500	1, 500	15	35	100	300	2. 5	4. 5	125	300	3. 5	5. 5
Lakeland sands, 0 to 5 percent slopes	100	250	10	25	500	1, 000	15	30	100	200	2	4	125	250	4	6
Lakeland sands, 5 to 8 percent slopes	90	200	8	20	300	800	10	20	100	200	2	4	125	250	4	6
Lakeland sands, 8 to 12 percent slopes							8	18	85	150	1	3	100	200	3	5
Lakeland sand, terrace	100	250	10	25	500	1, 000	15	30	100	200	2	4	125	250	2	4
Local alluvial land	150	200	30	80	500	1, 200	30	70	125	500	3	7	150	400	2. 5	6
Local alluvial land, wet																
Lynchburg sandy loam, 0 to 2 percent slopes	150	300	25	80	500	1, 000	30	60	125	500	3	7	175	425	3	6
Magnolia sandy loam, 0 to 2 percent slopes	300	600	30	75	750	2, 200	40	80	200	600	3	8	200	550	3	7
Magnolia sandy loam, 2 to 5 percent slopes, eroded	200	450	25	70	600	1, 800	30	60	175	550	2. 5	7	175	500	2	6
Magnolia sandy loam, 5 to 8 percent slopes, eroded	125	300	12	40	400	1, 200	20	40	175	550	2. 5	7	175	500	2	6
Mine pits and dumps																
Norfolk loamy sand, 0 to 2 percent slopes	200	450	30	80	700	2, 000	35	75	150	600	4	8	175	400	3	7
Norfolk loamy sand, 2 to 5 percent slopes	200	450	25	75	650	2, 000	35	75	150	600	4	8	175	400	3	7
Norfolk loamy sand, 2 to 5 percent slopes, eroded	150	350	20	50	500	1, 500	25	60	125	500	3	7	150	350	2	5
Norfolk loamy sand, 5 to 8 percent slopes, eroded	150	300	18	45	475	1, 300	20	40	100	350	2	6	150	300	1	4

TABLE 5.—*Estimated average acre yields of principal crops and annual gains in beef per acre of pasture under two levels of management*—Continued

[Yields in columns A are expected under prevailing management; yields in columns B are expected under best practical management but without irrigation. Absence of yield indicates crop is not suited to the soil specified or is not commonly grown on it]

Soils	Cotton (lint)		Corn		Peanuts		Oats		Coastal bermudagrass				Bahiagrass			
									Pasture		Hay		Pasture		Hay	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Lbs.	*Lbs.*	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Lb. of beef*	*Lb. of beef*	*Tons*	*Tons*	*Lb. of beef*	*Lb. of beef*	*Tons*	*Tons*
Norfolk loamy sand, thick surface, 2 to 5 percent slopes	160	375	18	45	600	1, 800	30	60	150	550	4	8	175	350	2	5
Norfolk loamy sand, thick surface, 5 to 8 percent slopes	125	300	15	35	500	1, 500	25	50	150	550	4	8	175	350	2	5
Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded	200	350	15	45	650	1, 800	20	50	100	450	3	7	150	350	4	6. 5
Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded	150	300	10	35	550	1, 600	15	40	85	350	2. 5	5	100	300	3	5. 5
Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded	100	250	8	25	500	1, 400	12	30	75	275	2	4	85	250	2. 5	4
Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded																
Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded																
Orangeburg loamy sand, 0 to 2 percent slopes	200	500	30	75	800	2, 000	40	80	150	600	4	8	175	400	3	7
Orangeburg loamy sand, 2 to 5 percent slopes	200	500	28	70	750	1, 800	35	75	150	600	4	8	175	400	3	7
Orangeburg loamy sand, 2 to 5 percent slopes, eroded	150	350	20	50	500	1, 500	25	60	125	500	3	7	150	350	2	5
Orangeburg loamy sand, 5 to 8 percent slopes, eroded	125	300	15	40	300	1, 200	20	40	100	350	2	6	125	300	1. 5	4
Orangeburg loamy sand, 8 to 12 percent slopes, eroded	100	250	10	30	250	1, 000	15	30	100	250	1. 5	4	115	275	1. 5	3. 5
Orangeburg loamy sand, 12 to 17 percent slopes, eroded																
Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded	75	150	5	25	200	600	10	20	85	200	1	3	100	250	1	3
Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded																
Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded																
Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded																
Orangeburg loamy sand, thick surface, 2 to 5 percent slopes	160	375	18	45	600	1, 800	30	60	150	550	4	8	175	350	2	5
Orangeburg loamy sand, thick surface, 5 to 8 percent slopes	125	300	15	35	500	1, 500	25	50	150	550	4	8	175	350	2	5
Red Bay loamy sand, 0 to 2 percent slopes	200	500	30	75	800	2, 000	40	80	150	600	4	8	175	400	3	7
Red Bay loamy sand, 2 to 5 percent slopes	200	500	28	70	750	1, 800	35	75	150	600	4	8	175	400	3	7
Red Bay loamy sand, 2 to 5 percent slopes, eroded	150	350	20	50	500	1, 500	25	60	125	500	3	7	150	350	2	5
Red Bay loamy sand, 5 to 8 percent slopes, eroded	125	300	15	40	300	1, 200	20	40	100	350	2	6	125	300	1. 5	4
Red Bay loamy sand, 8 to 12 percent slopes, eroded	100	250	10	30	250	1, 000	15	30	100	250	1. 5	4	115	275	1. 5	3. 5
Ruston loamy sand, 2 to 5 percent slopes	200	450	25	75	650	2, 000	35	75	150	600	4	8	175	400	3	7
Ruston loamy sand, 2 to 5 percent slopes, eroded	150	350	20	50	500	1, 500	25	60	125	500	3	7	150	350	2	5
Ruston loamy sand, 5 to 8 percent slopes, eroded	150	300	18	45	475	1, 300	20	50	100	350	2	6	125	300	1. 5	4
Ruston loamy sand, thick surface, 2 to 5 percent slopes	160	375	18	45	600	1, 800	30	60	150	550	4	8	175	350	2	5
Ruston loamy sand, thick surface, 5 to 8 percent slopes	125	300	15	35	500	1, 500	25	50	150	550	4	8	175	350	2	5
Sands over kaolinitic deposits													100	175	1	3
Sandy and clayey land, gently sloping, eroded									85	350	2	4. 5	100	300	2	4
Sandy and clayey land, sloping, eroded									75	250	1. 5	3	80	200	1	3

TABLE 5.—*Estimated average acre yields of principal crops and annual gains in beef per acre of pasture under two levels of management*—Continued

[Yields in columns A are expected under prevailing management; yields in columns B are expected under best practical management but without irrigation. Absence of yield indicates crop is not suited to the soil specified or is not commonly grown on it]

Soils	Cotton (lint)		Corn		Peanuts		Oats		Coastal bermudagrass				Bahiagrass			
									Pasture		Hay		Pasture		Hay	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Lbs.	*Lbs.*	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Lb. of beef*	*Lb. of beef*	*Tons*	*Tons*	*Lb. of beef*	*Lb. of beef*	*Tons*	*Tons*
Sandy and clayey land, strongly sloping, severely eroded																
Susquehanna sandy loam, 2 to 8 percent slopes, eroded																
Susquehanna sandy loam, 8 to 17 percent slopes, eroded																
Susquehanna sandy clay loam, 2 to 8 percent slopes, serverly eroded																
Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded																
Swamp																
Tifton fine sandy loam, 2 to 5 percent slopes	300	600	30	75	700	2,000	40	80	150	550	4	8	175	500	3	7
Tifton fine sandy loam, 2 to 5 percent slopes, eroded	200	450	25	70	600	1,800	30	60	125	500	3	7	150	475	2	6
Tifton fine sandy loam, 5 to 8 percent slopes, eroded	125	300	12	40	400	1,200	20	40	125	500	3	7	150	475	2	6
Wahee loamy sand	150	250	20	50	400	700	15	40	125	500	3	7	150	475	2.5	6
Wahee loamy sand, thick surface	150	250	20	50	400	700	15	40	125	500	3	7	150	475	2.5	6
Wehadkee silty clay loam																
Wet alluvial land																

3. Use cropping systems that conserve the soil and leave much residue.
4. Use high-yielding crop varieties that are suited to the county.
5. Control weeds, insect pests, and diseases.
6. Control water where needed by terracing, contour cultivation, drainage, vegetated waterways (fig. 10), and stripcropping.
7. Fertilize and lime as indicated by soil tests.

Unless soil tests are made, exact rates of fertilization cannot be determined for the crops listed in table 5. The need of each soil differs, partly because of past management, and partly because the kinds of fertilizer and rates of application change, as we learn more about fertilization. But to give approximate rates, J. R. JOHNSON, extension agronomist, Agriculture Extension Service, University of Georgia, suggests the following—

For *cotton*, apply 500 to 800 pounds of 4-12-12 [3] or 5-10-10 fertilizer per acre at planting time; as side dressing, apply 40 to 60 pounds of nitrogen, or as top dressing, apply 35 to 50 pounds of nitrogen.

For *corn*, apply 300 to 500 pounds of 4-12-12 fertilizer per acre or 400 to 600 pounds of 5-10-15 at planting time. As side dressing, apply 50 to 80 pounds of nitrogen, or as top dressing, apply 40 to 70 pounds of nitrogen.

For *peanuts*, apply 300 to 400 pounds of 4-12-12 or 5-10-15 fertilizer per acre at planting time. As side dressing or top dressing, apply 400 to 500 pounds of gypsum.

For *oats*, apply 300 to 500 pounds of 4-12-12 fertilizer per acre at planting time. As top dressing, apply 30 to 40 pounds of nitrogen.

For pasture of *bermudagrass and bahiagrass*, apply 400 to 500 pounds of 4-12-12 fertilizer per acre at seeding time. As top dressing, apply 60 to 110 pounds of nitrogen. To keep pasture productive, apply 400 to 600 pounds of 4-12-12 fertilizer near the end of each growing season.

Most soils in the county need lime, and the lime should be applied only as determined by soil tests.

***Figure 10.*—Dense sod of Coastal bermudagrass in this waterway controls runoff from the terraced field. Class II land.**

[3] Percentages of nitrogen, phosphate, and potash.

Woodland [4]

Stands of loblolly, shortleaf, and longleaf pines originally covered the uplands of Twiggs County. Yellow-poplar, gum, oak, maple, and ash were on bottom lands. By 1900 most of the original timber had been cut, and the uplands had reseeded naturally to loblolly and shortleaf pines. The stands of second-growth pine were cut heavily in the 1930's and 1940's. Hardwood trees of a high grade have been harvested periodically from most stands since 1900. The dominant trees in the wooded areas on the uplands are loblolly and shortleaf pines, and low-grade hardwoods are dominant on the bottom lands. Most soils in the county are well suited to trees. Farmers and foresters have started to restock sparse stands so that yields of wood products will be increased.

Approximately 79 percent of the total land area in Twiggs County is woodland. About 80 percent of this woodland is owned by farmers and other individuals, and the rest is owned by companies.

The wood-using industries in Twiggs County are small, but good markets for lumber and veneer products are in nearby counties. Pulpwood has been important in the economy of Twiggs County for the past 10 years because a large pulpmill in adjoining Bibb County has purchased it in large amounts. A market is needed for low-grade hardwoods that cannot be used for lumber and veneer.

Woodland suitability grouping

Management of woodland can be planned more easily if soils are grouped according to those characteristics that affect growth of trees and management of the stands. For this reason, the soils of Twiggs County have been placed in six woodland suitability groups. Each group consists of soils that have about the same suitability for wood crops, require about the same management, and have about the same potential productivity.

Listed in table 6, and later described in the text, are the six woodland suitability groups in this county. In table 6 the average site index is given for various kinds of trees on each suitability group, and also the hazards and limitations that affect the management of each group. The terms used in this table require explanation.

The potential productivity of a soil for a specified kind of tree is expressed as a *site index*. A site index for a given soil is the height, in feet, that a specified kind of tree growing on that soil will reach in 50 years. The site index of a soil is determined mainly by the capacity of the soil to provide moisture and growing space for tree roots. A site index in table 6 is an average for all the soils in the suitability group. The site index for any one soil in the group may be somewhat different from the average. For this reason, table 7 is provided. It gives site indexes by soil types, and it can be used by those who want more detailed information about productivity.

As shown in table 6, each woodland suitability group has, in varying degree, limitations that affect its management. Some of these limitations are expressed in the relative terms, *slight*, *moderate*, or *severe*. The relative term expresses the degree of limitation, as explained in the following:

PLANT COMPETITION: When a woodland is disturbed by fire, cutting, grazing or some other means, undesirable brush, trees, and plants may invade. The invading growth competes with the desirable trees and hinders their establishment and growth.

Competition is *slight* if unwanted plants are no special problem. It is *moderate* if the invaders delay but do not prevent the establishment of a normal, fully stocked stand. Where plant competition is moderate, seedbed preparation is generally not needed and simple methods can be used to prevent undesirable plants from invading. Competition is *severe* if trees cannot regenerate naturally. Where competition is severe, carefully prepare the site and use management that includes controlled burning, spraying with chemicals, and girdling.

EQUIPMENT LIMITATION: Drainage, slope, stoniness, soil texture, or other soil characteristics may restrict or prohibit the use of ordinary equipment in pruning, thinning, harvesting, or other woodland management. Different soils may require different kinds of equipment, methods of operation, or seasons when equipment may be used.

Limitation is *slight* if there are no restrictions on the type of equipment or on the time of year that the equipment can be used. It is *moderate* if slopes are moderately steep, if heavy equipment is restricted by wetness in winter and early in spring, or if the use of equipment damages the tree roots to some extent. Equipment limitation is *severe* if many types of equipment cannot be used, if the time equipment cannot be used is more than 3 months a year, and if the use of equipment severely damages the roots of trees and the structure and stability of the soil. Limitation is severe on moderately steep and steep soils that are stony and have rock outcrops. It is also severe on wet bottom lands and low terraces in winter or early in spring.

SEEDLING MORTALITY: Even when healthy seedlings of a suitable tree are correctly planted or occur naturally in adequate numbers, some of them will not survive if characteristics of the soil are unfavorable.

Mortality is *slight* if not more than 25 percent of the planted seedlings die, or if trees ordinarily regenerate naturally in places where there are enough seeds. It is *moderate* if 25 to 50 percent of the seedlings die, or if trees do not regenerate naturally in numbers needed for adequate restocking. In some places, replanting to fill open spaces will be necessary. Mortality is *severe*, if more than 50 percent of the planted seedlings die, or if trees do not ordinarily reseed naturally in places where there are enough seeds. If mortality is severe, plant seedlings where the seeds do not grow, prepare special seedbeds, and use good methods of planting to insure a full stand of trees.

WINDTHROW HAZARD: Soil characteristics affect the development of tree roots and the firmness with which the roots anchor the tree in the soil so that it resists the force of the wind. Root development may be prevented by a high water table or by an impermeable layer. The protection of surrounding trees also affects windthrow hazard. Knowing the degree of this hazard is important when choosing trees for planting

[4] This subsection was written by JOHN C. WOODS, soil scientist, and J. M. CASE and THOMAS A. MCFARLAND, woodland conservationists, Soil Conservation Service.

TABLE 6.—*Productivity, hazards, and management for woodland suitability groups*

Woodland suitability groups	Average productivity			Hazards and management
	Commercial trees	Site index [1]	Annual growth [2]	
			Bd. ft. per acre	
Group 1: Deep, well-drained soils with a moderately permeable subsoil— Faceville (FoB2, FoC2). Greenville (GoA, GoB, GoB2, GoC2, GoD2, GpD3, GpE3, GpF3). Magnolia (MxA, MxB2, MxC2). Norfolk (NfB, NfC, NhA, NhB, NhB2, NhC2, NiB2, NiC2, NiD2). Orangeburg (OcC3, OcD3, OcE3, OcF3, OdB, OdC, OeA, OeB, OeB2, OeC2, OeD2, OeE2). Red Bay (RgA, RgB, RgB2, RgC2, RgD2). Ruston (RiB, RiB2, RiC2, RjB, RjC). Tifton (TtB, TtB2, TtC2).	Slash pine	86	480	Plant competition slight. If necessary, remove or destroy unwanted trees and shrubs so that desirable seedlings can grow. Erosion severe on unprotected soils and roads with slopes of more than 8 percent.
	Loblolly pine	83	470	
	Shortleaf pine	72	390	
	Longleaf pine	70	230	
Group 2: Deep, moderately well drained to somewhat poorly drained soils with moderately slow permeability in the subsoil— Izagora (Iza) Local alluvial land (Lcm) Lynchburg (LtA). Wahee (Wah, Wat).	Loblolly pine	90	560	Plant competition moderate. If necessary, remove or destroy unwanted trees and shrubs so that desirable seedlings can grow. Equipment limitation moderate; wet soils may restrict use of ordinary equipment as much as 3 months a year.
	Slash pine	90	520	
	Shortleaf pine	70	360	
	Longleaf pine	75	410	
	Sweetgum	90	150	
	Red oak	80	130	
	White oak	80	130	
Group 3: Somewhat poorly drained to very poorly drained soils with a coarse to fine-textured subsoil— Chewacla (Csl). Grady (Gra). Local alluvial land, wet (Lcn). Wehadkee (Weh). Wet alluvial land (Wtl).	Loblolly pine	96	640	Seedling mortality severe. Drain excess water so that pine and high-grade hardwoods can regenerate. Equipment limitation generally slight, but logging and other work may be restricted by water on surface and in soil 3 years in 5. Frequent and extended floods decrease regeneration and restrict management work.
	Slash pine	88	500	
	Longleaf pine	87	[3]	
	Sweetgum	100	160	
	Cypress	[3]	[3]	
Group 4: Deep, coarse-textured, somewhat droughty soils— Americus (ArB). Eustis (EsB, EsC). Lakeland (LoB, LoC).	Loblolly pine	85	495	Seedling mortality moderate. Plant competition moderate. If necessary, remove or destroy unwanted trees or shrubs so that desirable seedlings can grow.
	Slash pine	80	410	
	Longleaf pine	70	230	
	Shortleaf pine	60	210	
Group 5: Deep to very deep, sandy very droughty soils— Eustis (ErB, ErC, ErD, Eus). Lakeland (Lak, LpB, LpC, LpD).	Slash pine	75	345	Plant competition from ground cover severe. Remove wiregrass and noncommercial hardwoods. Seedling mortality severe; prepare seedbed, use superior planting methods, and plant seeds of high quality.
	Longleaf pine	68	255	
	Loblolly pine	72	330	
	Shortleaf pine	65	285	
	Sand pine	[3]	[3]	
Group 6: Weakly developed soils and land types that have a firm to very firm, slowly permeable, sandy clay to clay subsoil— Susquehanna (SiC2, SiE2, SjC3, SjD3). Sandy and clayey land (SkC2, SkD2, SkE3). Sands over kaolinitic deposits (Sok).	Loblolly pine	70	300	Seedling mortality moderate to severe. Plant competition moderate. If necessary, remove or destroy unwanted trees and shrubs so that desirable seedlings can grow. Littleleaf disease prevalent, particularly in severely eroded areas.
	Slash pine	60	150	
	Longleaf pine	55	100	
	Shortleaf pine	58	190	

[1] Average height of dominant trees in stand at 50 years of age.
[2] Scribner's log rule at 50 years of age. Yields listed for fully stocked stand without intensive management and are adapted from data in USDA, Misc. Pub. 50 (*4*), USDA Tech. Bul. 560 (*2*), and SE. For. Ser. Expt. Sta. Occas. Paper 54 (*6*).
[3] Not estimated.

and when planning release cuttings or harvest cuttings.

The windthrow hazard is *slight* if roots hold the tree firmly against a normal wind. Individual trees are likely to remain standing if protective trees on all sides are removed. The hazard is *moderate* if the roots develop enough to hold the tree firmly except when the soil is excessively wet and the wind velocity is very high. It is *severe* if rooting is not deep enough to give adequate stability. Individual trees are likely to be blown over if they are released on all sides.

EROSION HAZARD: Woodland can be protected from erosion by choosing the kinds of trees, by adjusting the rotation age and cutting cycles, by using special tech-

TABLE 7.—*Average site index of commercially important trees for soil types*

Soil type [1]	Loblolly pine	Shortleaf pine	Longleaf pine	Slash pine	Red oak	White oak	Sweetgum
Americus loamy sand	85	60	70	80	(2)	(2)	(2)
Chewacla silt loam	96	(2)	(2)	88	(2)	(2)	100
Eustis loamy sand	88	62	70	80	(2)	(2)	(2)
Eustis sand	76	65	55	60	(2)	(2)	(2)
Faceville fine sandy loam	83	72	70	86	(2)	(2)	(2)
Grady sandy loam	91	(2)	(2)	85	(2)	(2)	100
Greenville clay loam	85	78	[3] 70	86	(2)	(2)	(2)
Greenville sandy loam	82	64	[3] 70	[3] 86	(2)	(2)	(2)
Izagora sandy loam	90	[3] 75	78	[3] 90	[3] 80	[3] 80	[3] 90
Lakeland loamy sands	96	60	71	80	(2)	(2)	(2)
Lakeland sands	85	72	65	82	(2)	(2)	(2)
Local alluvial land	76	67	72	80	[3] 80	[3] 80	[3] 100
Local alluvial land, wet	96	(2)	(2)	82	(2)	(2)	(2)
Lynchburg sandy loam	90	70	77	94	80	80	90
Magnolia sandy loam	80	76	70	86	(2)	(2)	(2)
Norfolk loamy sand	84	72	78	[3] 86	(2)	(2)	(2)
Orangeburg loamy sand	90	[3] 72	[3] 70	86	(2)	(2)	(2)
Orangeburg sandy loam	88	80	78	[3] 86	(2)	(2)	(2)
Red Bay loamy sand	[3] 83	[3] 72	[3] 70	[3] 86	(2)	(2)	(2)
Ruston loamy sand	83	72	63	86	(2)	(2)	(2)
Sandy and clayey land	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Sands over kaolinitic deposits	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Susquehanna sandy clay loam	[3] 70	61	[3] 58	60	(2)	(2)	(2)
Susquehanna sandy loam	[3] 70	61	[3] 58	60	(2)	(2)	(2)
Tifton fine sandy loam	83	[3] 72	75	83	(2)	(2)	(2)
Wahee loamy sand	81	[3] 70	74	[3] 90	(2)	(2)	[3] 90
Wehadkee silty clay loam	[3] 96	(2)	(2)	[3] 88	(2)	(2)	100
Wet alluvial land	(2)	(2)	(2)	(2)	(2)	(2)	(2)

[1] Binnsville clay, Gullied land, Mine pits and dumps, Oktibbeha-Eutaw-Susquehanna complexes, and Swamp are not listed, because they were not assigned to woodland suitability groups.

[2] Insufficient data for estimating site index.

[3] Data extrapolated from measurements on soils having similar characteristics.

niques in management, and by carefully constructing and maintaining roads, trails, and landings.

Erosion hazard is rated according to the risk of erosion on well-managed woodland that is not protected by special practices. It is *slight* where a small loss of soil is expected. Generally, erosion is slight if slopes range from 0 to 2 percent and runoff is slow or very slow. The erosion hazard is *moderate* if there is a moderate loss of soil where runoff is not controlled and the vegetative cover is not adequate for protection. It is *severe* where steep slopes, rapid runoff, slow infiltration and permeability, and past erosion make the soil susceptible to severe erosion.

On the following pages the six woodland suitability groups of this county are described, and the soils in each group are listed.

Because not enough data were available, the following soils and land types were not placed in woodland suitability groups:

BuB2 Binnsville clay, 2 to 8 percent slopes, eroded.
Gul Gullied land.
Mpd Mine pits and dumps.
OfB2 Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded.
OfD2 Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded.
Swa Swamp.

WOODLAND SUITABILITY GROUP 1

This group consists of the following deep, well-drained soils that are moderately permeable in the subsoil:

FoB2 Faceville fine sandy loam, 2 to 5 percent slopes, eroded.
FoC2 Faceville fine sandy loam, 5 to 8 percent slopes, eroded.
GoA Greenville sandy loam, 0 to 2 percent slopes.
GoB Greenville sandy loam, 2 to 5 percent slopes.
GoB2 Greenville sandy loam, 2 to 5 percent slopes, eroded.
GoC2 Greenville sandy loam, 5 to 8 percent slopes, eroded.
GoD2 Greenville sandy loam, 8 to 12 percent slopes, eroded.
GpD3 Greenville clay loam, 8 to 12 percent slopes, severely eroded.
GpE3 Greenville clay loam, 12 to 17 percent slopes, severely eroded.
GpF3 Greenville clay loam, 17 to 30 percent slopes, severely eroded.
MxA Magnolia sandy loam, 0 to 2 percent slopes.
MxB2 Magnolia sandy loam, 2 to 5 percent slopes, eroded.
MxC2 Magnolia sandy loam, 5 to 8 percent slopes, eroded.
NfB Norfolk loamy sand, thick surface, 2 to 5 percent slopes.
NfC Norfolk loamy sand, thick surface, 5 to 8 percent slopes
NhA Norfolk loamy sand, 0 to 2 percent slopes.
NhB Norfolk loamy sand, 2 to 5 percent slopes.
NhB2 Norfolk loamy sand, 2 to 5 percent slopes, eroded.
NhC2 Norfolk loamy sand, 5 to 8 percent slopes, eroded.
NiB2 Norfolk loamy sand, thin solum, 2 to 5 percent slopes eroded.
NiC2 Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded.
NiD2 Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded.
OcC3 Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded.
OcD3 Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded.
OcE3 Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded.
OcF3 Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded.
OdB Orangeburg loamy sand, thick surface, 2 to 5 percent slopes.

Figure 11.—**Stand of pine on a Norfolk loamy sand. Stand has been thinned to increase growth of desired trees. Woodland suitability group 1.**

OdC	Orangeburg loamy sand, thick surface, 5 to 8 percent slopes.
OeA	Orangeburg loamy sand, 0 to 2 percent slopes.
OeB	Orangeburg loamy sand, 2 to 5 percent slopes.
OeB2	Orangeburg loamy sand, 2 to 5 percent slopes, eroded.
OeC2	Orangeburg loamy sand, 5 to 8 percent slopes, eroded.
OeD2	Orangeburg loamy sand, 8 to 12 percent slopes, eroded.
OeE2	Orangeburg loamy sand, 12 to 17 percent slopes, eroded.
RgA	Red Bay loamy sand, 0 to 2 percent slopes.
RgB	Red Bay loamy sand, 2 to 5 percent slopes.
RgB2	Red Bay loamy sand, 2 to 5 percent slopes, eroded.
RgC2	Red Bay loamy sand, 5 to 8 percent slopes, eroded.
RgD2	Red Bay loamy sand, 8 to 12 percent slopes, eroded.
RiB	Ruston loamy sand, 2 to 5 percent slopes.
RiB2	Ruston loamy sand, 2 to 5 percent slopes, eroded.
RiC2	Ruston loamy sand, 5 to 8 percent slopes, eroded.
RjB	Ruston loamy sand, thick surface, 2 to 5 percent slopes.
RjC	Ruston loamy sand, thick surface, 5 to 8 percent slopes.
TtB	Tifton fine sandy loam, 2 to 5 percent slopes.
TtB2	Tifton fine sandy loam, 2 to 5 percent slopes, eroded.
TtC2	Tifton fine sandy loam, 5 to 8 percent slopes, eroded.

On these soils the average site index is 86 for slash pine, 83 for loblolly pine, 72 for shortleaf pine, and 70 for longleaf pine.

If the overstory has been removed, plant competition is not serious enough to prevent adequate restocking, but the growth of desired trees will be more rapid if the stand is thinned (fig. 11). Seedbeds should be prepared and other management followed. Seedling mortality is not a problem in planting trees on soils of this group.

Chiefly because of gullying, soil erosion is a moderate hazard on slopes of 5 to 8 percent. It is a severe hazard on slopes of more than 8 percent. Erosion is not a problem on slopes of less than 5 percent. Damage from windthrow is slight, and except on the steeper slopes, the use of equipment has few limitations.

WOODLAND SUITABILITY GROUP 2

This group consists of deep, medium-textured, moderately well drained to somewhat poorly drained soils. Permeability is moderately slow in the subsoil. The soils are—

Iza	Izagora sandy loam.
Lcm	Local alluvial land.
LtA	Lynchburg sandy loam, 0 to 2 percent slopes.
Wah	Wahee loamy sand.
Wat	Wahee loamy sand, thick surface.

On these soils the average site index is 90 for slash pine, 70 for shortleaf pine, 75 for longleaf pine, 90 for sweetgum, and 80 for red oak and white oak.

Partly because moisture is abundant for long periods, plant competition is moderate. It generally does not prevent restocking of desired species, but it may slow initial growth. Remove unwanted trees to allow seedlings to get established and to grow more rapidly. Seedling mortality is slight.

Soil erosion is not a problem, and the windthrow hazard is slight. These soils may be wet for as much as 3 months each year. Because the use of equipment in wet periods damages tree roots and the structure and stability of the soils, equipment should be used only in dry periods.

WOODLAND SUITABILITY GROUP 3

In this group are deep, low-lying, somewhat poorly drained to very poorly drained soils and land types that have a subsoil of sand to clay and are flooded periodically. They are—

Csl	Chewacla silt loam.
Gra	Grady sandy loam.
Lcn	Local alluvial land, wet.
Weh	Wehadkee silty clay loam.
Wtl	Wet alluvial land.

On these soils the average site index is 96 for loblolly pine, 88 for slash pine, 87 for longleaf pine, and 100 for sweetgum. But stands of pines on waterlogged soils are seldom fully stocked. Generally, areas covered by water for long periods are in cypress.

Because moisture is abundant, noncommercial trees, shrubs, and vines compete severely with desired trees, even if the overstory has been removed. The desired trees do not restock naturally. Practice water control, site preparation, control of unwanted trees, planting and replanting, and other appropriate management. Because drainage is poor and floods are periodic, seedling mortality is severe and satisfactory stands can be expected only about 2 years in every 5.

Soil erosion is not a problem, and the windthrow hazard is slight. Floods, surface water, or general wetness severely limits the use of equipment. Build roads and dig drainage ditches so that equipment may be used without damaging the soil structure, disturbing soil stability, or injuring tree roots.

WOODLAND SUITABILITY GROUP 4

In this group are the following deep, coarse-textured somewhat droughty soils:

ArB	Americus loamy sand, 2 to 5 percent slopes.
EsB	Eustis loamy sand, shallow, 0 to 5 percent slopes.
EsC	Eustis loamy sand, shallow, 5 to 8 percent slopes.
LoB	Lakeland loamy sands, shallow, 2 to 5 percent slopes.
LoC	Lakeland loamy sands, shallow, 5 to 8 percent slopes.

On these soils the average site index is 85 for loblolly pine, 80 for slash pine, 70 for longleaf pine, and 60 for shortleaf pine.

Plant competition is moderate if the overstory has been removed or there are openings in the canopy. Seedlings

usually become established, but the competing plants may prevent them from growing naturally. Seedling mortality generally is moderate, mainly because the surface layer dries out quickly after it is wet. Seedling mortality is severe in spring and early in summer if there is little rainfall.

The erosion hazard and equipment limitations are slight. Because the root zone is thick, the windthrow hazard is slight.

WOODLAND SUITABILITY GROUP 5

In this group are the following deep to very deep, sandy, very droughty soils:

ErB	Eustis sand, 2 to 5 percent slopes.
ErC	Eustis sand, 5 to 8 percent slopes.
ErD	Eustis sand, 8 to 12 percent slopes.
Eus	Eustis sand, terrace.
Lak	Lakeland sand, terrace.
LpB	Lakeland sands, 0 to 5 percent slopes.
LpC	Lakeland sands, 5 to 8 percent slopes.
LpD	Lakeland sands, 8 to 12 percent slopes.

On these soils the average site index is 75 for slash pine, 68 for longleaf pine, 72 for loblolly pine, and 65 for shortleaf pine.

Plant competition is moderate if the overstory has been removed, but grasses and other ground cover may compete severely with seedlings for moisture. Disking, planting in shallow furrows, and other special practices are necessary if stands of pine are to be adequate.

Partly because these soils are droughty, many seedlings die the first few years. Seedling mortality is severe, and the trees do not regenerate naturally. If seedlings are planted and plant competition is controlled, satisfactory restocking can be expected 1 or 2 years in every 5. To establish adequate stands, use special seedbed preparation, superior planting methods, and seeds of good quality. A good stand of slash pine is shown in figure 12.

Soil erosion is not a problem on slopes of less than 5 percent and is moderate on slopes of 5 to 12 percent. Because the root zone is thick, the windthrow hazard is slight.

The use of equipment is moderately limited on slopes of less than 8 percent and is severely limited on slopes of more than 8 percent. It is generally necessary to build and maintain roads for equipment.

The lack of sufficient moisture in these soils is the greatest limitation to the growth of trees.

WOODLAND SUITABILITY GROUP 6

This group consists of the following weakly developed soils and land types that have a subsoil of firm to very firm, slowly permeable sandy clay to clay:

SiC2	Susquehanna sandy loam, 2 to 8 percent slopes, eroded.
SiE2	Susquehanna sandy loam, 8 to 17 percent slopes, eroded.
SjC3	Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded.
SjD3	Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded.
SkC2	Sandy and clayey land, gently sloping, eroded.
SkD2	Sandy and clayey land, sloping, eroded.
SkE3	Sandy and clayey land, strongly sloping, severely eroded.
Sok	Sands over kaolinitic deposits.

On these soils the average site index is 70 for loblolly pine, 60 for slash pine, 55 for longleaf pine, and 58 for shortleaf pine.

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Figure 12.—**A young stand of slash pine on Eustis sand, 5 to 8 percent slopes. Woodland suitability group 5.**

If the overstory has been removed, plant competition is moderate but does not prevent the restocking of desired trees. Generally, seedlings grow normally if unwanted trees and shrubs are removed. Because these clayey soils have a low moisture-supplying capacity, seedling mortality is moderate and replanting is often necessary.

Soil erosion is severe on the strong slopes and is moderate on the more gentle ones. The windthrow hazard is moderate because the soils are slowly permeable and roots are not likely to go far enough into the subsoil. Ordinary equipment should not be used continuously on the steeper slopes in wet periods.

Protective practices

Grazing, fire, insects, and disease damage or destroy trees and reduce the amount of wood products harvested.

Protection from grazing: Wooded areas ought to be protected from heavy grazing, for heavy grazing not only destroys seedlings and damages trees but also makes the soil more likely to erode and less likely to take in and store water for trees. If it is not controlled, grazing is particularly harmful on steep or eroded woodland. Where some grazing is necessary, the livestock should be distributed so that not more than 40 percent of the low-growing cover is eaten. Grazing is less harmful to woodland in April, May, and June than it is at other times because more forage is available in those months. Cattle generally damage trees less than other grazing animals.

Protection from fire: Fire kills seedlings, young trees, and some of the larger trees. It also destroys humus and litter and thereby increases the hazard of erosion. Firebreaks help protect wooded areas by checking or stopping fires. A firebreak may be a road in the woods or a plowed or disked fire lane. At a firebreak, the firefighters can start a backfire, which is a fire set to counter an advancing fire. Firebreaks should tie into streams, ponds, public roads, utility rights-of-way, or other barriers.

Protection from insects and disease: Serious losses from diseases and insects are not likely on woodland in Twiggs County. To avoid damage from insects, cuttings should be made in fall or winter. Log the woodland with care so that the trees left standing are not scarred and made more susceptible to disease.

Wildlife [5]

The importance of fish and wildlife is increasing rapidly in Twiggs County. As the acreage in row crops decreases, deer, turkeys, squirrels, and other animals that live in woods are benefited by an increase in the acreage of woodland.

The fish in the county have increased, mainly because more than 100 farm ponds have been constructed. These ponds have also helped to increase waterfowl. The soil, topography, and water supply of the county favor the construction of more ponds.

On the bottom lands along the Ocmulgee River, trees produce mast for wild animals. Deer and turkeys have always existed in fairly large numbers on those bottom lands, but because of good management and protection, the population of both is increasing.

Good practices of wildlife management are being carried out on many farms. In recent years the number of bobwhite has been increased by managing the soil and planting suitable food and cover. Native grasses and legumes also furnish abundant food for quail.

Mourning doves thrive best in the southeastern part of the county where much millet, grain sorghum, peanuts, and peas are grown. Hunting mourning doves is a popular sport in the county.

Although many areas in the northern part of the county have been strip mined and ruined for agricultural purposes, many of these areas could be developed for fish and wildlife. Old pits filled with water could be stocked with fish and seeded to plants that furnish food for waterfowl. Bicolor lespedeza and sericea lespedeza are suitable for stabilizing stripped areas. These plants, which furnish good cover and large quantities of food for land birds, would attract quail and other birds.

Engineering Applications [6]

Soil engineering is a part of structural engineering and deals with soils as the foundation material on which structures rest and with soils used as structural material. Generally, soils are used in the locality and in the condition they are found. A large part of soil engineering consists of locating the various soils, of determining their engineering properties and how those properties meet the requirements of the job, and of selecting the best material for each job.

Engineers of the United States Bureau of Public Roads and the Soil Conservation Service collaborated with soil scientists of the Soil Conservation Service in preparing this subsection. These specialists combined their knowledge to interpret, from the results of laboratory tests and field experience, the soil conditions that apply to engineering.

The information in this report will help engineers and others who work with soils in construction. Special emphasis has been placed on properties that affect engineering, especially those that affect irrigation structures, farm ponds, terraces, and farm drainage. Also emphasized are those properties that are considered in locating highways, pipelines, airports, and other structures that rest on the soil. In addition, the report is helpful in selecting and developing sites for industrial, business, residential, and recreational development.

The mapping and the description of soils in the soil survey report are somewhat generalized, however, and should be used only in planning more detailed field surveys to determine the condition of the soil, in place, at the site of the proposed engineering construction.

Most of the information in this section is in tables 8, 9, and 10, but information useful to engineers also can be found in other sections of this report, particularly "Descriptions of Soils" and "Formation and Classification of Soils."

This report uses agricultural terms to describe soils and their uses in farming and related fields. Many of these terms have a meaning to agricultural workers that differs from the meaning understood by engineers. These terms are defined in the Glossary in their agricultural sense.

Engineering classification

AASHO classification system.—Most highway engineers classify soil materials according to the system approved by the American Association of State Highway Officials (*1*). In this system soil materials are classified in seven principal groups. The groups range from A–1, consisting of gravelly soil of high bearing capacity, to A–7, consisting of clayey soils having low strength when wet. Within each group the relative engineering value of the soil material is indicated by a group index number. These numbers range from 0 for the best materials to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol in table 8.

Unified classification system.—Some engineers prefer to use the Unified soil classification system (*8*). In this system soil material is put into 15 classes that are designated by pairs of letters. These classes range from GW, consisting of well-graded gravel, gravel and sand mixtures, and a little fine material, to Pt, consisting of peat and other highly organic soil materials.

Soil test data

To help evaluate the soils for engineering purposes, samples were taken from 14 profiles of 6 extensive soil series and were tested according to standard procedures. The test data are given in table 8, on pages 46 and 47. Because only a few samples of each soil series were tested, the data probably do not show the maximum variation in the horizons of each soil series. At most sites, the samples were obtained at a depth of 6 feet or less. The test data, therefore, may not be adequate for estimating the characteristics of soil materials from deep cuts in the substratum.

The engineering soil classifications in table 8 are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. Mechanical analyses were made by the combined sieve and hydrometer methods. The percentage of clay obtained by the hydrometer method should not be used in naming textural classes of soils.

The tests for liquid limit and plastic limit measure the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to a semisolid,

[5] R. A. GRIZZELL, JR., biologist, Soil Conservation Service, assisted in writing this subsection.

[6] P. F. DOMINY, agricultural engineer, Soil Conservation Service, assisted in writing this subsection.

or a plastic. As the moisture content is further increased, the material changes from a plastic to a liquid. The plastic limit is the moisture content at which the soil material passes from a semisolid to a plastic. The liquid limit is the moisture content at which the material passes from the plastic to a liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which the soil material is plastic.

Engineering descriptions of soils

In table 9, beginning on page 48, are descriptions of the soils in the county and estimates of their physical properties. For each series the soils are described by layers that have properties significant to engineering. These layers may not be the same as the layers described in the section "Descriptions of Soils" or "Formation and Classification of Soils." The soils are described in table 9 in terms of the Unified and AASHO classification systems. The dominant texture of each layer is listed according to the textural classification of the United States Department of Agriculture. Also listed for the layers are the estimated percentages of material that will pass a No. 10 sieve, a No. 40 sieve, and a No. 200 sieve.

Estimates of available moisture capacity show the number of inches of water needed to wet 1 foot of air-dried soil material. Permeability is estimated for each layer in place, without compaction. The rating for shrink-swell potential indicates how much the soil material changes in volume when its moisture content changes. This potential is estimated primarily on the basis of the amount and kind of clay contained. In general, soils classified as CH and A–7 have a high shrink-swell potential. Soils with low shrink-swell potential are clean sand and gravel, soils that contain small amounts of nonplastic and slightly plastic fines, and most other nonplastic and slightly plastic soils.

Engineering interpretation of soils

Table 10, beginning on page 54, gives (1) features that affect the vertical alinement of highways; (2) estimates of the suitability of materials for fill, for subgrade, and cuts, and (3) the suitability of areas of soils for farm ponds, sprinkler irrigation, terraces, farm drainage, and septic tanks.

The ratings of suitability are based on the test data in table 8, on the estimates in table 9, and on observations of soils in the field. Each soil series is rated *good*, *fair*, or *poor*, according to the suitability of its soils for fill, for subgrade material, and in cuts. The soil series are also rated according to suitability for various kinds of construction.

The features relating to drainage that affect the vertical alinement of highways include a high water table, flooding, and permeability of the soil. Also affecting vertical alinement of highways are the presence of plastic soils, shallowness to bedrock, and the stability and erodibility of the soil materials. Informtation on these features can be obtained by studying in table 10 the columns "Suitability of material for subgrade and cuts."

Most soils are suitable for fill material. Exceptions are the heavy clayey soils and highly organic, mucky soils. Material used for subgrade, however, should be better than that used for fill. Clayey soils are poor subgrade material. Subgrade material should be the best soil material available for a road base. It should contain enough clay to compact readily. Also, it should be well drained and free from seepage and should have a low shrink-swell potential. A good sandy loam is excellent subgrade material.

Plastic soils that have a high shrink-swell potential are rated *poor* for subgrade. For fill they are rated *poor* or *fair*, depending on their content of water, and on how easy they are to handle, to dry, and to compact. Fine sands, silts, and other highly erodible soils are rated *poor* or *fair* for fill. To prevent the fills from washing away, fine sands and silts require gentle slopes, close control of moisture during compaction, and fast-growing vegetation on the side slopes. Generally, the rating of the soils in the county for road fill is somewhat better than that for road subgrade.

Formation and Classification of Soils

This section has two main parts. The first part tells how the factors of soil formation affected the development of soils in Twiggs County. In the second part, the soil series represented in the county are described and are placed in higher categories.

Formation of Soils

Soil is produced when parent materials, topography, climate, and living organisms interact for a period of time. These factors, including time, determine the nature of a soil that develops at any point on the earth. All of these factors affected the formation of each soil in Twiggs County.

The relative importance of each factor differs from place to place. In some areas one factor may be more important than the others, and in a few places one factor may even dominate in the formation of a soil and fix most of its properties. Most properties of a soil that develops in quartz sand, for example, are fixed by the sand because it strongly resists weathering and little can happen to it. In Twiggs County the Lakeland soils developed from quartz sand and have only faint horizons. Nevertheless, distinct horizons can be formed in quartz sand under certain kinds of vegetation if the topography is low and flat and the water table is high.

Parent materials

Parent materials are the unconsolidated mass from which soils develop. They are largely responsible for the chemical and mineralogical composition of soils. In Twiggs County the parent materials of all soils are sedimentary; that is, they have been transported from other areas by the ocean or by streams and have been deposited in their present position.

In Twiggs County differences in parent materials are largely the result of the manner in which the sands, silts, and clays were sorted and deposited. Different kinds of soils have developed because of these differences and because the parent materials have been above water for different lengths of time. Where the materials have been above water for a long time, profile development is generally strong, for one or more of the soil-forming factors have had a long time to work on the parent materials.

TABLE 8.—*Engineering test data* [1] *for*

Soil name and location	Bureau of Public Roads reports No.	Depth	Horizon	Moisture-density [2]	
				Maximum dry density	Optimum moisture
		Inches		*Lb. per cu. ft.*	*Percent*
Eustis sand:					
1½ miles SE. of Jeffersonville on State Route 127. (Modal)	S 34385	0–7	A_p	115	11
	S 34386	23–40	C_{11}	127	9
	S 34387	64–75	C_2	118	13
¾ mile E. of Bullard on Marion Road. (Variation)	S 34388	0–8	A_p	124	10
	S 34389	26–56	C_1	127	9
	S 34390	56–72+	C_2	126	9
Greenville sandy loam:					
¼ mile W. of Tarversville on State Route 127. (Modal)	S 34391	0–7	A_p	121	12
	S 34392	21–84	B_2	107	19
¾ mile N. of Bleckley Co. line on U.S. Highway No. 129. (Variation)	S 34393	0–3	A_p	116	13
	S 34394	36–72+	B_{22}	107	19
Lakeland sands:					
4 miles SW. of Danville on Cool Springs Church Road. (Modal)	S 34400	0–6	A_p	119	9
	S 34401	6–22	A_2	121	8
	S 34402	22–72+	C_1	124	9
Just S. of Flat Creek in borrow pit E. of U.S. Highway No. 129. (Variation)	S 34403	0–6	A_p	109	13
	S 34404	18–72+	C_1	109	14
Orangeburg sandy loam:					
1 mile W. of Bullard. (Modal)	S 34405	0–6	A_p	114	11
	S 34406	14–72	B_2	113	15
50 yards NW. of New Hope Church on old Richland Church Road. (Variation)	S 34407	0–7	A_p	113	10
	S 34408	15–72	B_2	106	20
Sands over kaolinitic deposits:					
1¾ miles SE. of Myricks Mill. (Modal)	S 34395	0–9	A_p	106	16
	S 34396	14–48	C_1	105	18
	S 34397	48–72+	C_2	114	14
¼ mile W. of State Route 18 on Myricks Mills Road. (Variation)	S 34398	0–4	A_p	114	13
	S 34399	16–72+	C	104	20
Susquehanna sandy loam:					
W. of intersection of Dry Branch Road and State Route 57. (Modal)	S 34409	0–8	A_p	118	12
	S 34410	8–30	C_1	95	25
	S 35411	30–72	C_2	75	38
2½ miles N. of Jeffersonville on State Route 18. (Variation)	S 34412	0–7	A_p	115	14
	S 34413	15–34	C_{12}	107	18
	S 34414	48–72	D	90	27
Susquehanna sandy loam:					
E. of intersection of Dry Branch Road and State Route 57. (Modal)	S 34379	0–5	A_p	104	17
	S 34380	12–33	B_3	77	36
	S 34381	45–72+	C_2	78	36
300 yards W. of State Route 18 on Myricks Mill Road. (Variation)	S 34382	0–4	A_p	109	14
	S 34383	4–15	B_2	96	23
	S 34384	41–72	C_2	92	26

[1] Tests performed by the Bureau of Public Roads according to standard procedures of the American Association of State Highway Officials (AASHO).

[2] Based on the Moisture-density Relations of Soils, Using 5.5-pound Rammer and 12-inch Drop, AASHO Designation T99–57, Method A, except for No. S34402, for which Method C was used (*1*).

[3] Mechanical analyses according to the American Association of State Highway Officials Designation T88 (*1*). Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter

soil samples taken from 14 soil profiles

Mechanical analysis [3]							Liquid limit	Plasticity index	Classification	
Percentage passing sieve—			Percentage smaller than—						AASHO [4]	Unified [5]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
100	92	22	19	14	8	4	(6)	(6)	A-2-4(0)	SM.
100	92	29	25	21	17	14	(6)	(6)	A-2-4(0)	SM.
100	93	38	33	30	27	24	29	14	A-6(1)	SC.
100	77	26	23	17	12	10	(6)	(6)	A-2-4(0)	SM.
100	76	27	24	20	15	13	(6)	(6)	A-2-4(0)	SM.
100	75	25	21	18	14	12	(6)	(6)	A-2-4(0)	SM.
100	93	37	32	27	21	16	20	5	A-4(0)	SM-SC.
100	96	60	58	55	54	51	46	27	A-7-6(13)	CL.
100	95	42	37	29	23	19	22	7	A-4(1)	SM-SC.
100	95	57	55	52	49	48	42	22	A-7-6(9)	CL.
100	73	18	14	7	3	2	(6)	(6)	A-2-4(0)	SM.
100	76	17	13	9	4	2	(6)	(6)	A-2-4(0)	SM.
[7] 93	68	17	13	8	6	2	(6)	(6)	A-2-4(0)	SM.
100	86	13	11	8	6	3	(6)	(6)	A-2-4(0)	SM.
100	86	13	12	9	6	3	(6)	(6)	A-2-4(0)	SM.
100	90	21	17	11	6	3	(6)	(6)	A-2-4(0)	SM.
100	95	52	49	44	40	38	37	19	A-6(7)	CL.
100	90	19	13	7	5	3	(6)	(6)	A-2-4(0)	SM.
100	94	60	57	54	51	49	44	22	A-7-6(10)	CL.
100	82	34	31	27	20	14	28	6	A-2-4(0)	SM-SC.
100	89	76	74	68	55	39	44	17	A-7-6(12)	ML-CL.
100	76	54	52	46	37	24	35	14	A-6(5)	CL.
100	95	30	21	11	7	4	(6)	(6)	A-2-4(0)	SM.
100	98	86	82	68	55	47	43	20	A-7-6(13)	CL.
100	87	41	33	16	9	6	(6)	(6)	A-4(1)	SM.
100	88	77	73	60	53	50	95	61	A-7-5(20)	CH.
100	99	98	94	84	77	73	126	79	A-7-5(20)	CH.
100	90	35	31	23	17	13	25	8	A-2-4(0)	SC.
100	92	45	42	38	36	34	45	23	A-7-5(6)	SC.
100	94	75	72	61	56	53	91	57	A-7-5(20)	CH.
100	81	55	48	32	21	15	37	14	A-6(6)	ML-CL.
100	96	91	89	83	74	71	115	71	A-7-5(20)	CH.
----------	----------	98	93	79	72	62	98	57	A-7-5(20)	MH-CH.
100	93	29	25	17	11	8	(6)	(6)	A-2-4(0)	SM.
100	98	66	63	57	54	51	72	43	A-7-6(17)	CH.
100	99	92	86	64	55	50	94	61	A-7-5(20)	CH.

is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming texture classes for soils.

[4] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 7): The classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, AASHO Designation M145-49 (*1*).

[5] Based on the Unified Soil Classification System, Technical Memorandum No. 3-357, Volume 1, Waterways Experiment Station, Corps of Engineers, March 1953 (*8*).

[6] Nonplastic.

[7] No. 4 sieve (4.7 mm.) passes 98 percent, ⅜-inch sieve passes 99 percent, and ¾-inch sieve passes 100 percent.

TABLE 9.—*Characteristics of soils and physical*

Map symbol	Soils [1]	Brief soil description and engineering classification of soil material	Depth from surface (typical profile)
			Inches
ArB	Americus loamy sand, 2 to 5 percent slopes	60 inches or more of SM (A–2); somewhat excessively drained.	0–60
BuB2	Binnsville clay, 2 to 8 percent slopes, eroded	6 inches of CH (A–7) underlain by marl or clayey marl CH (A–7); moderately well drained.	0–6 6–60+
Csl	Chewacla silt loam	6 inches of ML (A–4) underlain to a depth of 36 inches by CL (A–6, A–7); somewhat poorly drained and moderately well drained.	0–16 16–36+
EsB EsC	Eustis loamy sand, shallow, 0 to 5 percent slopes Eustis loamy sand, shallow, 5 to 8 percent slopes.	60 inches or more of SM (A–2); somewhat excessively drained.	0–60
ErB ErC ErD Eus	Eustis sand, 2 to 5 percent slopes Eustis sand, 5 to 8 percent slopes. Eustis sand, 8 to 12 percent slopes. Eustis sand, terrace.	60 inches or more of SM (A–2); excessively drained	0–60
FoB2 FoC2	Faceville fine sandy loam, 2 to 5 percent slopes, eroded Faceville fine sandy loam, 5 to 8 percent slopes, eroded.	4 to 6 inches of SC (A–4) underlain by 10 to 20 inches of SC or CL (A–6) in turn underlain by 40 to 50 inches or more of CL (A–7); well drained.	0–9 9–20 20–60+
Gra	Grady sandy loam	6 to 8 inches of SC (A–4) underlain by 20 to 30 inches of SC or CL (A–6) in turn underlain by 30 to 40 inches or more of CL (A–7); poorly drained.	0–6 6–14 14–60+
GpD3	Greenville clay loam, 8 to 12 percent slopes, severely eroded.	1 to 4 inches of CL (A–6) or CH (A–7) underlain by 60 inches or more of CL (A–7); highly weathered; well drained.	0–4 4–60+
GpE3 GpF3	Greenville clay loam, 12 to 17 percent slopes, severely eroded. Greenville clay loam, 17 to 30 percent slopes, severely eroded.		
GoA GoB GoB2 GoC2 GoD2	Greenville sandy loam, 0 to 2 percent slopes Greenville sandy loam, 2 to 5 percent slopes. Greenville sandy loam, 2 to 5 percent slopes, eroded. Greenville sandy loam, 5 to 8 percent slopes, eroded. Greenville sandy loam, 8 to 12 percent slopes, eroded.	4 to 6 inches of SC (A–4) underlain by 60 inches or more of CL (A–7); highly weathered; well drained.	0–7 7–60+
Iza	Izagora sandy loam	6 to 10 inches of SC (A–4) underlain by 15 to 20 inches of SC or CL (A–6), in turn underlain by 20 to 40 inches or more of CL (A–7); moderately well drained.	0–10 10–30 30–60+
LoB LoC	Lakeland loamy sands, shallow, 2 to 5 percent slopes Lakeland loamy sands, shallow, 5 to 8 percent slopes.	60 inches or more of SM (A–2); somewhat excessively drained.	0–60+
LpB LpC LpD Lak	Lakeland sands, 0 to 5 percent slopes Lakeland sands, 5 to 8 percent slopes. Lakeland sands, 8 to 12 percent slopes. Lakeland sand, terrace.	60 inches or more of SM (A–2); excessively drained	0–60+
Lcm	Local alluvial land	In many places 8 to 16 inches of SC (A–4) underlain by 20 to 52 inches or more of SC or CL (A–6); variable; moderately well drained.	0–16 16–60
Lcn	Local alluvial land, wet	In many places 6 to 10 inches of SM (A–2) underlain by 40 to 50 inches or more of SC or CL (A–6); highly variable; poorly drained.	0–10 10–50+
LtA	Lynchburg sandy loam, 0 to 2 percent slopes	6 to 18 inches of SC (A–4) underlain by 20 to 40 inches of SC or CL (A–6); somewhat poorly drained.	0–18 18–60
MxA MxB2 MxC2	Magnolia sandy loam, 0 to 2 percent slopes Magnolia sandy loam, 2 to 5 percent slopes, eroded. Magnolia sandy loam, 5 to 8 percent slopes, eroded.	4 to 8 inches of SC (A–4) underlain by 40 to 60 inches or more of CL (A–7); well drained	0–9 9–60+

properties that affect their engineering uses

Dominant USDA texture	Percentage passing—			Permeability	Available moisture capacity	Reaction (pH)	Shrink-swell potential
	No. 10 sieve (2.0 mm.)	No. 40 sieve (0.42 mm.)	No. 200 sieve (0.074 mm.)	*Inches per hour*	*Inches per foot*		
Loamy sand	100	75–92	15–30	5. 0 –10. 0	0. 7	5. 0–5. 5	Low.
Clay	100	90–98	85–95	0. 05– 0. 20	1. 6	7. 5	High.
Clayey marl	100	92–98	85–95	0. 05	. 5	9. 0	High.
Silt loam	100	90–95	70–80	0. 8 – 2. 5	1. 5	4. 5–5. 5	Low.
Silty clay to silty clay loam	100	92–98	75–90	0. 5 – 0. 8	2. 0	4. 5–5. 5	Moderate.
Loamy sand	100	75–92	15–30	5. 0 –10. 0	. 7	5. 0–5. 5	Low.
Sand	100	70–80	15–25	>10. 0	. 5	4. 5–5. 5	Low.
Fine sandy loam	100	90–95	35–45	0. 8 – 2. 5	. 9	5. 0–5. 5	Low.
Sandy clay loam	100	92–97	45–55	0. 20– 0. 80	1. 2	4. 5–5. 5	Moderate.
Sandy clay	100	94–98	55–65	0. 05– 0. 20	1. 5	4. 5–5. 5	Moderate.
Sandy loam	100	90–95	35–45	0. 8 – 2. 5	1. 0	4. 5–5. 5	Low.
Sandy clay loam	100	92–98	45–60	0. 20– 0. 80	1. 2	4. 5–5. 5	Moderate.
Sandy clay or clay	100	94–98	55–85	0. 05– 0. 20	1. 3	4. 0–5. 0	Moderate.
Clay loam	100	90–96	55–75	0. 05– 2. 0	1. 3	5. 0–5. 5	Moderate to high.
Sandy clay	100	94–97	55–65	0. 5 – 2. 0	1. 3	4. 5–5. 0	Moderate.
Sandy loam	100	85–94	35–45	0. 8 – 2. 5	. 9	4. 5–5. 0	Low.
Sandy clay loam to sandy clay	100	90–97	55–65	0. 05– 0. 2	1. 3	4. 5–5. 0	Moderate.
Sandy loam	100	85–94	35–45	0. 8 – 2. 5	1. 0	4. 5–5. 5	Low.
Sandy clay loam	100	93–98	45–55	0. 2 – 0. 8	1. 2	4. 5–5. 5	Moderate.
Sandy clay	100	95–98	55–70	0. 05– 0. 2	1. 4	4. 5–5. 5	Moderate.
Loamy sand	100	75–92	15–30	5. 0–10. 0	. 7	4. 5–5. 5	Low.
Sand	100	70–80	15–25	>10. 0	. 5	4. 5–5. 5	Low.
Sandy loam	100	70–90	35–45	0. 8 – 2. 5	1. 0	4. 5–5. 5	Low.
Sandy clay loam	100	85–95	45–55	0. 20– 0. 8	1. 4	4. 0–4. 5	Moderate.
Sand	100	55–80	15–30	>10. 0	. 5	5. 5–5. 0	Very low.
Sandy clay loam	100	90–95	45–55	0. 2 – 0. 8	1. 0	4. 0–4. 5	Moderate.
Sandy loam	100	85–94	35–45	0. 0 – 2. 5	1. 1	4. 5–5. 5	Low.
Sandy clay loam	100	90–98	45–60	0. 2 – 0. 8	1. 5	4. 5–5. 5	Moderate.
Sandy loam	100	90–95	35–45	0. 8 – 2. 5	1. 0	5. 0–6. 0	Low.
Sandy clay	100	94–97	55-70	0. 2 – 0. 8	1. 3	4. 5–5. 5	Moderate.

TABLE 9.—*Characteristics of soils and physical*

Map symbol	Soils [1]	Brief soil description and engineering classification of soil material	Depth from surface (typical profile)
			Inches
NhA	Norfolk loamy sand, 0 to 2 percent slopes	6 to 10 inches of SM (A–2) underlain by 30 to 40 inches of SC or CL (A–6) in turn underlain by 10 to 20 inches of SC (A–4); well drained.	0–11
NhB	Norfolk loamy sand, 2 to 5 percent slopes.		11–40
NhB2	Norfolk loamy sand, 2 to 5 percent slopes, eroded.		50–60+
NhC2	Norfolk loamy sand, 5 to 8 percent slopes, eroded.		
NfB	Norfolk loamy sand, thick surface, 2 to 5 percent slopes	18 to 30 inches of SM (A–2) underlain by 20 to 40 inches of SC or CL (A–6); in turn underlain by 10 to 20 inches of SC (A–4); well drained.	0–30
NfC	Norfolk loamy sand, thick surface, 5 to 8 percent slopes.		30–60
			60–70+
NiB2	Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded.	9 inches of SM (A–2) underlain by 27 inches of SC or CL (A–6) underlain by SC (A–4) to a depth of 60 inches; well drained.	0–10
NiC2	Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded.		10–30
NiD2	Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded.		30–60+
OeA	Orangeburg loamy sand, 0 to 2 percent slopes	2 to 14 inches of SM (A–2) underlain by 50 inches or more of SC or CL (A–6) underlain in places by SC (A–4) at a depth of about 50 inches; well drained.	0–10
OeB	Orangeburg loamy sand, 2 to 5 percent slopes.		10–72+
OeB2	Orangeburg loamy sand, 2 to 5 percent slopes, eroded.		
OeC2	Orangeburg loamy sand, 5 to 8 percent slopes, eroded.		
OeD2	Orangeburg loamy sand, 8 to 12 percent slopes, eroded.		
OeE2	Orangeburg loamy sand, 12 to 17 percent slopes, eroded.		
OdB	Orangeburg loamy sand, thick surface, 2 to 5 percent slopes.	18 to 30 inches of SM (A–2) underlain by 20 inches to 40 inches of SC or CL (A–6), in turn underlain by 10 to 20 inches or more of SC (A–4); well drained.	0–30
OdC	Orangeburg loamy sand, thick surface, 5 to 8 percent slopes.		30–60
			60–70+
OcC3	Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded.	2 to 4 inches of SC (A–4) underlain by 50 inches or more of SC (A–6) underlain in places by SC (A–4) at a depth of about 50 inches; welld rained.	0–4
OcD3	Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded.		4–72+
OcE3	Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded.		
OcF3	Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded.		
OfB2	Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded.	Variable, but chiefly 2 to 60 inches CH (A–7); moderately well to poorly drained.	0–40+
OfD2	Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded.		
RgA	Red Bay loamy sand, 0 to 2 percent slopes	8 to 14 inches of SM (A–2) underlain by 30 inches to 40 inches of SC or CL (A–6), in turn underlain by 10 to 20 inches or more of SC (A–4); well drained.	0–17
RgB	Red Bay loamy sand, 2 to 5 percent slopes.		17–40
RgB2	Red Bay loamy sand, 2 to 5 percent slopes, eroded.		40–50+
RgC2	Red Bay loamy sand, 5 to 8 percent slopes, eroded.		
RgD2	Red Bay loamy sand, 8 to 12 percent slopes, eroded.		
RiB	Ruston loamy sand, 2 to 5 percent slopes	6 to 16 inches of SM (A–2) underlain by 30 to 40 inches of SC or CL (A–6), in turn underlain by 10 to 20 inches of SC (A–4); well drained.	0–14
RiB2	Ruston loamy sand, 2 to 5 percent slopes, eroded.		14–36
RiC2	Ruston loamy sand, 5 to 8 percent slopes, eroded.		36–60+
RjB	Ruston loamy sand, thick surface, 2 to 5 percent slopes	18 to 30 inches of SM (A–2) underlain by 20 to 40 inches of SC or CL (A–6), in turn underlain by 10 to 20 inches of SC (A–4); well drained.	0–30
RjC	Ruston loamy sand, thick surface, 5 to 8 percent slopes.		30–60
			60–70+
Sok	Sands over kaolinitic deposits	Variable, but commonly 6 to 15 inches of SM (A–2) underlain by 20 to 60 inches or more of SC or CL (A–6); well drained.	0–16
			16–50+
SkC2	Sandy and clayey land, gently sloping, eroded	Variable, but generally 6 to 8 inches of SM (A–2) underlain by 20 to 40 inches or more of SC or CL (A–6) or (A–7); well drained.	0–8
SkD2	Sandy and clayey land, sloping, eroded.		8–40
SkE3	Sandy and clayey land, strongly sloping, severely eroded	6 to 10 inches of SC or CL over 45 inches or more of CL (A–7); well drained.	0–8
			8–50+
SiC2	Susquehanna sandy loam, 2 to 8 percent slopes, eroded	2 to 8 inches of SC (A–4) underlain by 60 inches+ of CH (A–7); somewhat poorly drained.	0–4
SiE2	Susquehanna sandy loam, 8 to 17 percent slopes, eroded.		4–60+
SjC3	Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded.	0 to 3 inches of SC–CL (A–6) underlain by 60 inches or more of CH (A–7); somewhat poorly drained.	0–3
			3–60+
SjD3	Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded.		

properties that affect their engineering uses—Continued

Dominant SDA texture	Percentage passing—			Permeability	Available moisture capacity	Reaction (pH)	Shrink-swell potential
	No. 10 sieve (2.0 mm.)	No. 40 sieve (0.42 mm.)	No. 200 sieve (0.074 mm.)				
				Inches per hour	*Inches per foot*		
Loamy sand	100	80–92	15–30	5. 0 –10. 0	0. 7	5. 0–6. 0	Low.
Sandy clay loam	100	92–98	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Sandy clay loam to sandy loam	100	85–92	35–50	2. 5 – 5. 0	1. 2	4. 5–5. 0	Low.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 7	5. 0–6. 0	Low.
Sandy clay loam	100	92–98	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Sandy loam	100	80–90	35–45	2. 5 – 5. 0	1. 2	4. 5–5. 0	Low.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 9	4. 5–5. 5	Low.
Sandy clay loam	100	92–98	45–55	0. 2 – 0. 8	1. 4	4. 5–5. 5	Moderate.
Sandy loam	100	80–92	35–45	0. 8 – 2. 5	1. 1	4. 5–5. 5	Low.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 7	5. 0–6. 0	Low.
Sandy clay loam	100	92–98	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 7	5. 0–6. 0	Low.
Sandy clay loam	100	92–98	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Sandy loam	100	85–95	35–45	2. 5 – 5. 0	1. 2	4. 5–5. 0	Low.
Sandy loam	100	85–95	35–45	0. 8 – 2. 5	1. 0	5. 0–5. 5	Low.
Sandy clay loam	100	92–98	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Clay	100	94–100	80–95	<0. 05	2. 0	5. 5–7. 5	High.
Loamy sand	100	80–92	15–35	5. 0 –10. 0	. 7	5. 0–6. 0	Low.
Sandy clay loam	100	92–97	45–55	0. 8 – 2. 5	1. 4	4. 5–5. 0	Moderate.
Sandy loam	100	85–95	35–45	2. 5 – 5. 0	1. 2	4. 5–5. 0	Low.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 7	5. 0–6. 0	Low.
Sandy clay loam	100	92–97	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Sandy clay loam	100	90–97	35–45	2. 5 – 5. 0	1. 2	4. 5–5. 0	Low.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 7	4. 0–6. 0	Low.
Sandy clay loam	100	92–97	45–60	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Sandy loam	100	80–90	35–45	2. 5 – 5. 0	1. 2	4. 5–5. 0	Low.
Loamy sand	100	80–92	15–30	5. 0 –10. 0	. 7	5. 0–5. 5	Low.
Sandy clay loam	100	92–98	45–55	0. 20– 0. 8	1. 0	4. 5–5. 5	Moderate.
Loamy sand	100	80–94	20–30	5. 0 –10. 0	. 9	5. 0–5. 5	Low.
Sandy clay loam to sandy clay	100	90–95	45–65	0. 2 – 0. 8	1. 4	4. 5–5. 5	Moderate.
Sandy clay loam	100	90–96	40–60	0. 2 – 0. 8	1. 0	4. 5–5. 0	Low.
Sandy clay	100	94–97	50–65	0. 05– 0. 2	1. 1	4. 5–5. 0	Moderate.
Sandy loam	100	87–97	35–45	2. 5 – 5. 0	1. 5	4. 5–5. 0	Low.
Clay	100	94–100	80–95	<0. 05	2. 0	5. 5–7. 5	High.
Sandy clay loam	100	90–96	45–55	0. 8 – 2. 5	1. 5	4. 5–5. 0	Moderate.
Clay	100	94–100	85–95	<0. 05	2. 0	5. 5–7. 5	High.

TABLE 9.—*Characteristics of soils and physical*

Map symbol	Soils [1]	Brief soil description and engineering classification of soil material	Depth from surface (typical profile)
			Inches
TtB	Tifton fine sandy loam, 2 to 5 percent slopes	2 to 8 inches of SC (A–4) underlain by 16 to 30 inches of SC or CL (A–6), in turn underlain by 8 to 10 inches of CH (A–7); many concretions of iron; well drained.	0–8
TtB2	Tifton fine sandy loam, 2 to 5 percent slopes, eroded.		8–24
TtC2	Tifton fine sandy loam, 5 to 8 percent slopes, eroded.		24–40+
Wah	Wahee loamy sand	4 to 10 inches of SM (A–2) underlain by 18 to 30 inches of SC or CL (A–6) underlain by 30 inches or more of CH (A–7); somewhat poorly to moderately well drained.	0–6 6–27 27–37
Wat	Wahee loamy sand, thick surface	18 to 30 inches of SM (A–2) underlain by 4 to 10 inches of SC or CL (A–6), in turn underlain by 30 inches or more of CH (A–7); somewhat poorly drained.	0–30 30–40 40–60+
Weh	Wehadkee silty clay loam	2 to 60 inches or more of CL (A–7); poorly drained	0–60+
Wtl	Wet alluvial land	In many areas 6 to 10 inches of SM (A–2) underlain by 40 to 50 inches of SC or CL (A–6); highly variable; very poorly drained.	0–10 10–50+

[1] Gullied land, Mine pits and dumps, and Swamp vary, and their properties are not estimated for engineering uses.

The parent materials of soils in about 40 percent of the county weathered from the Barnwell formation of the Eocene epoch. These parent materials are deeply weathered sandy loams, sandy clay loams, and clays. In about 20 percent of the county, the parent materials weathered from the Flint River formation of the Oligocene epoch. These materials are sands, loamy sands, sandy loams, and sandy clay loams. The yellow soils of the southeastern part of the county weathered from the Flint River formation. Parent materials of sands, sandy loams, and sandy clays were derived from the Clayton formation, which underlies about 15 percent of the county. The Clayton formation is of the Paleocene epoch.

Materials from Ocala limestone of the Eocene epoch gave rise to soils in a small area in the southwestern part of the county, locally called the Black Belt. These soils are underlain by chalk, marl, or limestone. In the northern part of the county the soils have formed from material of the Tuscaloosa formation. This formation, the oldest in the county, is Upper Cretaceous. Parent materials derived from the Tuscaloosa formation are thick beds of sands, loamy sands, sandy loams, and sandy clays from the Coastal Plain. The most recently formed soils in the county are along the Ocmulgee River in the western part. These soils formed in alluvial deposits influenced by other alluvial deposits brought down from the Piedmont by the Ocmulgee River. Along some of the smaller streams the alluvium is chiefly material from the Coastal Plain. The soils on flood plains are still receiving deposits and have had little horizon development. Those on the old, high terraces, however, have been in place long enough to develop distinct horizons.

Topography

The topography of the county was determined by geologic history. Most important were stream dissection and the underlying formations of bedrock. Soil formation is influenced by topography through its effect on moisture, erosion, temperature, and plant cover. This influence, however, is modified by the influence of the other four factors of soil formation.

The slopes in Twiggs County range from 0 to 30 percent. In upland areas soils generally are deeper and horizons are more distinct where slopes are less than about 12 percent. Where slopes are more than 12 percent, geologic erosion removes soil material almost as fast as it is formed. As a result, many of the soils on the steeper slopes have thin, weakly expressed profiles and other characteristics of Lithosols.

In the southeastern part of the county where the slopes are less than 5 percent, the soils are deep and have strongly developed profiles. Examples of strongly developed soils are the Norfolk, Tifton, Ruston, and Greenville. In these soils the soil-forming factors have been very active, and the influence of each factor usually is evident.

The soils in alluvium are level and are continually receiving deposits that are washed from surrounding soils on uplands. Because the soils in alluvium are young, topography is the only major soil-forming factor that is appreciably active, and consequently a developed profile has not formed.

Time

The length of time required for a soil to develop depends largely on the intensity of the other soil-forming factors. Where the forces of soil formation are active, less time is required for soil to become mature. For example, soils develop more rapidly in humid, warm regions that have luxuriant vegetation than they do in dry or cold regions with scanty vegetation. Other things being equal, less time is required if the parent material is coarse textured than if it is fine textured.

The soils in Twiggs County range from those that have been forming on uplands for thousands of years to those that have been in place in alluvium on first bottoms for only a few days. Intermediate in age are soils that developed on stream terraces in old alluvium. Horizons are strongly developed in the oldest soils but are absent in the

properties that affect their engineering uses—Continued

Dominant SDA texture	Percentage passing—			Permeability	Available moisture capacity	Reaction (pH)	Shrink-swell potential
	No. 10 sieve (2.0 mm.)	No. 40 sieve (0.42 mm.)	No. 200 sieve (0.074 mm.)				
				Inches per hour	*Inches per foot*		
Fine sandy loam	100	90–95	35–45	2. 5 – 5. 0	1. 5	4. 5–5. 0	Low.
Sandy clay loam	100	92–97	45–60	0. 8 – 2. 5	1. 4	4. 5–5. 0	Moderate.
Sandy clay to sandy clay loam	100	92–97	55–65	0. 05– 0. 2	1. 5	4. 5–5. 5	Moderate.
Loamy sand	100	75–92	15–30	5. 0 –10. 0	1. 5	5. 0–5. 5	Low.
Sandy clay to clay	100	94–98	45–60	0. 05– 0. 20	1. 7	5. 0–5. 5	Moderate.
Clay to sandy clay	100	92–98	75–95	<0. 05	2. 0	4. 5–5. 0	High.
Loamy sand	100	75–92	15–30	5. 0 –10. 0	1. 5	5. 0–5. 5	Low.
Sandy clay loam	100	92–97	45–60	0. 05– 0. 20	1. 5	4. 5–5. 0	Moderate.
Clay	100	94–98	75–95	<0. 05	2. 0	5. 5–7. 5	High.
Silty clay loam	100	94–98	50–75	0. 2 – 0. 8	2. 0	4. 5–5. 5	Moderate.
Sand	100	48–60	15–30	>10. 0	. 5	5. 5–5. 0	Very low.
Sandy clay loam	100	92–97	45–55	0. 2 – 0. 8	1. 0	4. 0–4. 5	Moderate.

youngest. Horizon development varies from slight to strong in the soils of intermediate age.

Time is important in the development of different soils if the other processes of soil formation have about equal effects.

Climate

Climate, particularly temperature and rainfall, largely determines the rate and nature of the physical, chemical, and biological processes that affect the weathering of soil materials. Rainfall, freezing, thawing, wind, and sunlight have much to do with the breakdown of rocks and minerals, the release of plant nutrients, and other processes that affect the development of soils. The amount of water that actually percolates through the soil at a given point depends on rainfall, relative humidity, length of the frost-free period, soil permeability, and physiographic position. Temperature influences the kinds of organisms that live in a soil and their growth, as well as the speed of physical and chemical reactions.

The warm, humid climate of Twiggs County is characterized by long hot summers and short mild winters. The average rainfall is about 48 inches per year. (See table 1, page 2.) Much of the time from the first part of December through July, the soils are moist and subject to leaching. They are moderately dry to dry much of August, September, October, and the first half of November. Because the soils in the county freeze for only short periods and in only the top part, freezing and thawing have little effect on weathering and the soil-forming processes. The climate is uniform throughout the county, and its affect on soil development has been about the same in all parts. As is normal in this climate, most soils on uplands in Twiggs County are highly weathered, leached, strongly acid, and low in natural fertility.

Living organisms

Plants and animals affect the development of the soil profile by supplying organic matter and by bringing up plant nutrients from the lower layers. Most of the organic matter comes from vegetation that grows on the soil, particularly that of trees and shrubs. These higher plants furnish an enormous amount of organic material in a long period. They also transfer plant nutrients from the subsoil to the surface soil by assimilating these elements into the tissue of the plants and then depositing this tissue on the surface as fallen fruit, leaves, or stems.

The kinds and number of plants and animals that live on and in the soil are determined largely by the climate and, to a lesser extent, by parent materials, relief, and age of the soil. Earthworms and other small invertebrates greatly alter the physical and the chemical condition of the soil. They slowly but continuously mix the soil and make it more permeable to water and air. Millions of bacteria, fungi, and other micro-organisms are in the soil, but little is known of their activities. It is known that the micro-organisms work mostly in the upper few inches of soil and that they are extremely important in the development of soils. The micro-organisms change vegetable material into organic matter and continuously affect the physical and chemical properties of the soils.

The native vegetation of the county was oak and pine on the uplands; it was yellow-poplar, sweetgum, blackgum, willows, and water-loving oaks on the low, wet, swampy areas. This vegetation returned large amounts of organic matter to the soils over a long period of time.

Man has disturbed the direction and rate of soil development in many areas by clearing, cultivating, draining, and irrigating. Except for a sharp reduction in the content of organic matter and greatly accelerated erosion, few results of the changes made by man can be seen. These changes will be reflected in the future by the direction and rate of soil genesis. Some results of artificial drainage and irrigation are apparent. Not apparent as a result of man's activity are the drastic changes in the complex of soil organisms that affect soil genesis.

Classification of Soils

The soil classification used in the United States consists of six categories, one above the other. Beginning

TABLE 10.—*Engineering*

Soil series and map symbols	Drainage affecting vertical alinement of highways	Suitability of material for—		
		Fill	Subgrade	Cuts
Americus (ArB)	Somewhat excessive; rapid permeability.	Poor to fair; erodible.	Fair	Fair; requires very gentle slopes; subject to erosion.
Binnsville (BuB2)	Internal drainage very slow	Poor	Poor	Poor; slips or sloughs when wet; marl, chalk, or limestone at a depth of 6 inches.
Chewacla (Csl)	Somewhat poor to moderately good; subject to overflow.	Poor to fair	Poor	Cuts seldom made (bottom land).
Eustis (EsB, EsC)	Somewhat excessive; internal drainage rapid.	Poor to fair; erodible.	Fair	Fair; requires gentle slopes; subject to erosion.
Eustis (ErB, ErC, ErD, Eus)	Internal drainage very rapid	Good	Fair to good	Fair; subject to erosion.
Faceville (FoB2, FoC2)	Good; internal drainage moderate to moderately slow.	Good	Good	Good; subject to erosion on steep side slopes.
Grady (Gra)	Poor; high water table; ponded in depressions.	Poor	Poor	Poor; sinks and shallow depressions. Cuts seldom made.
Greenville (GoA, GoB, GoB2, GoC2, GoD2, GpD3, GpE3, GpF3)	Good; internal drainage moderate to moderately slow.	Good	Fair to good	Good; subject to erosion on steep side slopes.
Izagora (Iza)	Moderately high water table; internal drainage slow.	Good	Fair to good	Good; steep cuts subject to erosion.
Lakeland (LoB, LoC, LpB, LpC, LpD, Lak)	Internal drainage rapid to very rapid.	Fair to good	Fair to good	Poor to fair; subject to erosion
Local alluvial land (Lcm, Lcn)	High water table at times; internal drainage moderately rapid.	Fair	Poor	Drainageways; cuts seldom made.
Lynchburg (LtA)	High water table; internal drainage moderate to moderately slow.	Fair	Fair	Low position; cuts seldom made.
Magnolia (MxA, MxB2, MxC2)	Good; internal drainage moderate to moderately slow.	Good	Fair	Good; subject to erosion on strong slopes.
Norfolk (NfB, NfC, NhA, NhB, NhB2, NhC2, NiB2, NiC2, NiD2)	Good; internal drainage moderately rapid to moderate.	Good	Good	Good; subject to erosion on steep side slopes.
Oktibbeha - Eutaw - Susquehanna complex (OfB2, OfD2)	Internal drainage very slow	Poor	Poor	Poor; slips and sloughs when wet.
Orangeburg (OcC3, OcD3, OcE3, OcF3, OdB, OdC, OeA, OeB, OeB2, OeC2, OeD2, OeE2)	Good; internal drainage moderately rapid to moderate.	Good	Good	Good; subject to erosion on steep side slopes.
Red Bay (RgA, RgB, RgB2, RgC2, RgD2)	Good; internal drainage moderate to moderately rapid.	Good	Good	Good; subject to erosion on steep side slopes.
Ruston (RiB, RiB2, RiC2, RjB, RjC)	Good; internal drainage moderate to moderately rapid.	Good	Good	Good; subject to erosion on steep side slopes.
Sands over kaolinitic deposits (Sok)	Internal drainage slow	Good to fair	Fair	Good to fair; subject to erosion.
Sandy and clayey land (SkC2, SkD2, SkE3)	Internal drainage slow	Poor to fair	Poor	Fair to good; subject to moderate erosion.
Susquehanna (SiC2, SiE2, SjC3, SjD3)	Internal drainage very slow	Poor	Poor	Poor; sloughs or slips when wet.
Tifton (TtB, TtB2, TtC2)	Good; internal drainage rapid	Good	Good	Good; subject to erosion on steep side slopes.
Wahee (Wah, Wat)	High water table; internal drainage very slow.	Poor	Poor	Low position; cuts seldom made.
Wehadkee (Weh)	High water table; subject to overflow.	Poor	Poor	Low position; cuts seldom made.
Wet alluvial land (Wtl)	Poor; high water table	Poor to fair	Poor	Low position; cuts seldom made.

interpretations of soils

Suitability of areas for—				
Farm ponds	Irrigation (sprinkler)	Terraces	Farm drainage	Septic tanks
Poor; excessive seepage may occur.	Poor; low moisture-holding capacity.	Not needed; rapid infiltration.	Not needed	Good; rapid percolation.
Poor; swells when wet; shrinks when dry.	Poor; very slow infiltration.	Soil not suited to cultivation.	Not needed	Very poor; very slow percolation.
Good; level	Not generally needed	Not needed	Fair to poor; moderate permeability and high water table.	Poor; high water table; subject to overflow.
Poor; excessive seepage may occur.	Poor; low moisture-holding capacity; rapid permeability.	Not needed; very rapid infiltration.	Not needed	Good; very permeable.
Poor	Poor; very low moisture-holding capacity; rapid permeability.	Not needed	Not needed	Good; very permeable.
Good; slowly permeable.	Good; moderate infiltration; moderate to high moisture-holding capacity.	Good	Not needed	Good; percolation adequate.
Good; very slowly permeable.	Not needed	Terraces not needed	Poor; slowly to very slowly permeable and outlets difficult to develop.	Poor; slow to very slow percolation; ponded for long periods.
Good; compacts well	Good except on strong slopes.	Good on slopes of less than 8 percent.	Not needed	Fair; percolation adequate.
Good; soil material favorable and level terrain.	Good; infiltration rapid; moderate moisture-holding capacity.	Terraces not needed	Moderate response poor; slowly permeable.	Fair to poor; slow permeability; moderately high water table.
Poor; excessive seepage may occur.	Low moisture-holding capacity.	Terraces not needed	Not needed	Favorable; very rapid percolation.
Poor; much sandy material; excessive seepage may occur.	Not needed	Not needed; used for waterways.	Good; moderate permeability.	Poor; high water table.
Good; moderately slow permeability.	Good; rapid intake; moderate moisture-holding capacity.	Not needed	Good; moderately slow permeability; high water table.	Fair to poor; high water table.
Good; compacts well; little seepage.	Good; except on strong slopes.	Good on slopes less than 8 percent.	Not needed	Fair to good; percolation adequate.
Good; compacts well	Good; rapid infiltration; moderate permeability.	Good on slopes less than 8 percent.	Not needed	Good; rapid percolation.
Poor; difficult to compact.	Soils generally not cultivated.	Not suited; slow infiltration in clayey soil.	Poor; internal drainage very slow.	Very poor; very slow percolation.
Good; good foundation; compacts well.	Good in level areas; rapid infiltration; moderate moisture-holding capacity.	Good on slopes of less than 8 percent.	Not needed	Good; rapid percolation.
Good; good foundation; compacts well.	Good in level areas; rapid infiltration; moderate moisture-holding capacity.	Good on slopes of less than 8 percent.	Not needed	Good; rapid percolation.
Good; good foundation; compacts well.	Good in level areas; rapid infiltration; moderate water-holding capacity.	Good on slopes of less than 8 percent.	Not needed	Good; rapid percolation.
Poor; variable texture	Not suited to cultivation	Not needed	Not needed	Poor; variable percolation.
Poor; variable material	Not suited to cultivation	Not needed	Not needed	Poor; variable percolation.
Poor; difficult to dry and compact.	Not suited to cultivation	Not needed	Poor; slow permeability.	Very poor; very slow percolation.
Good; good foundation; compacts well.	Good in level areas; rapid infiltration; moderate moisture-holding capacity.	Good on slopes of less than 8 percent.	Not needed	Good; rapid percolation.
Good; little seepage but difficult to dry and compact.	Fair	Not needed	Fair; moderately slow permeability.	Poor; slow percolation and high water table.
Poor; floods frequent	Not needed	Not needed	Fair to good	Poor; overflow and high water table.
Good	Not suited to cultivation	Not needed	Variable; slowly permeable in places.	Very poor; overflow and high water table.

at the top, the six categories are the order, suborder, great soil group, family, series, and type (*3*, *5*).

In the highest category the soils of the whole country are grouped into three orders; in the lowest category thousands of soil types are recognized. The suborder and family categories have never been fully developed and have been little used. Most attention has been given to the classification of soils into soil types and series within counties or comparable areas and to the subsequent grouping of series into great soil groups. Soil types are further broken down into phases, for which finer distinction in the use and management can be made.

Classes in the highest category of the classification scheme are the zonal, intrazonal, and azonal orders. The zonal order consists of soils with evident, genetically related horizons that reflect the predominant influence of climate and living organisms in their formation. In Twiggs County the great soil groups in the zonal order are the Red-Yellow Podzolic soils and the Reddish-Brown Lateritic soils.

The intrazonal order consists of soils with evident, genetically related horizons that reflect the dominant influence of a local factor of topography or parent materials over the effects of climate or living organisms. In Twiggs County the great soil groups in the intrazonal order are the Low-Humic Gley soils, Rendzina soils, Grumusols, and Planosols.

The azonal order consists of soils that lack distinct, genetically related horizons because the soils are young, have resistant parent material, or are on steep slopes. In Twiggs County the great soil groups in the azonal order are the Regosols and Alluvial soils.

Soils in eight great soil groups occur in Twiggs County. About 63 percent of the county consists of representative Red-Yellow Podzolic soils, and about 5 percent consists of weakly developed Red-Yellow Podzolic soils that have some characteristics of Regosols. Approximately 15 percent of the county is made up of Regosols. The Reddish-Brown Lateritic soils cover about 10 percent of the county, and the Alluvial soils, about 5 percent. Low-Humic Gley soils, Rendzina soils, Grumusols, and Planosols each occupy less than 1 percent.

Table 11 lists the soil series by great soil groups and gives some of the distinguishing characteristics of each

TABLE 11.—*Characteristics and genetic relationships of soil series*

ZONAL

Great soil group and soil series	Profile description	Position	Drainage	Slope	Parent material	Degree of profile development
Red-Yellow Podzolic soils—				*Percent*		
Faceville	Very dark grayish-brown to dark yellowish-brown fine sandy loam over friable, strong-brown to yellowish-red sandy clay.	Upland slopes and ridges.	Good	2 to 8	Beds of acid sandy loam, sandy clay loam, and sandy clay.	Strong.
Izagora [1]	Pale-brown sandy loam underlain by yellowish-brown sandy clay loam to sandy clay at a depth of about 16 inches.	High terraces	Moderately good to somewhat poor.	0 to 2	Old alluvium	Medium.
Lynchburg [1]	Dark-gray to gray sandy loam over friable, light yellowish-brown to light-gray sandy clay loam.	Upland flats and low areas adjacent to drains.	Somewhat poor	0 to 2	Beds of acid loamy sands, sandy loams, and sandy clay.	Medium.
Magnolia [2]	Grayish-brown sandy loam over red to dark-red sandy clay.	Upland slopes and ridges.	Good	0 to 8	Beds of acid sandy clay and clay.	Strong.
Norfolk	Dark grayish-brown loamy sand over friable, yellowish-brown to strong-brown sandy clay loam.	Upland slopes and ridges.	Good	0 to 12	Beds of acid sandy loam, sandy clay loam, and sandy clay.	Strong.
Oktibbeha	Dark reddish-brown fine sandy loam over reddish-brown heavy clay; contains many concretions of lime at a depth of 30 inches.	Upland slopes and ridges.	Moderately good.	2 to 12	Thin beds of clay over marl, chalk, or limestone.	Medium.
Orangeburg [2]	Dark grayish-brown loamy sand underlain by friable, red to dark-red sandy clay loam.	Upland slopes and ridges.	Good	0 to 30	Beds of acid sandy loam and sandy clay loam.	Strong.
Ruston	Dark grayish-brown loamy sand underlain by friable, yellowish-red sandy clay loam at a depth of 10 to 18 inches.	Upland slopes and ridges.	Good	2 to 8	Beds of sandy clay loam.	Strong.
Susquehanna [3]	Dark-gray sandy loam underlain by mottled, plastic clay at a depth of 3 to 6 inches.	Upland slopes and ridges.	Somewhat poor	2 to 17	Thick beds of acid, plastic clay.	Weak.

TABLE 11.—*Characteristics and genetic relationships of soil series*—Continued

ZONAL—Continued

Great soil group and soil series	Profile description	Position	Drainage	Slope	Parent material	Degree of profile development
Red-Yellow Podzolic soils—Continued				*Percent*		
Tifton	Dark grayish-brown fine sandy loam over yellowish-brown, friable sandy clay to sandy clay loam.	Upland slopes and ridges.	Good	2 to 8	Marine deposits of sandy clay.	Strong.
Reddish-Brown Lateritic soils—						
Greenville	Dark reddish-brown sandy loam over dark-red, friable sandy clay.	Upland slopes and ridges.	Good	0 to 30	Sandy clay loam and sandy clay underlain by siliceous limestone in places.	Strong.
Red Bay	Dark-brown to dark reddish-brown loamy sand over dark-red, friable to firm sandy clay loam.	Upland slopes and ridges.	Good	0 to 12	Beds of sand and sandy clay.	Strong.

INTRAZONAL

Low-Humic Gley soils—						
Grady	Very dark gray sandy loam underlain by gray to light-gray sandy clay at a depth of 10 to 18 inches.	Saucerlike depressions and sinks on uplands.	Poor	0 to 2	Beds of acid sandy loam and clay.	Weak.
Wehadkee	Very dark gray silty clay loam over mottled gray silty clay loam to silty clay.	Flood plain	Poor	0 to 2	Recent alluvium	Weak.
Rendzina soils—						
Binnsville	Dark-gray clay underlain by marl or limestone at a depth of about 6 inches.	Upland slopes and ridges.	Moderately good.	2 to 8	Material weathered from chalk, marl, or limestone.	Weak.
Grumusol—						
Eutaw	Black fine sandy loam over mottled, gray heavy clay.	Upland slopes	Poor	2 to 12	Clay over marl, chalk, or limestone.	Weak.
Planosol (with argipan)—						
Wahee	Grayish-brown loamy sand over mottled, yellowish-brown fine sandy clay to clay.	Low stream terraces.	Moderately good to somewhat poor.	0 to 2	Old alluvium	Medium to strong.

AZONAL

Regosols—						
Americus	Dark-brown to reddish-brown loamy sand over dark-red loamy sand to a depth of 30 inches or more.	Upland slopes and ridges.	Somewhat excessive.	2 to 5	Beds of acid loamy sand and sand.	Weak.
Eustis	Dark grayish-brown loamy sand over strong-brown to yellowish-red sandy loam to sandy clay loam.	Upland slopes and ridges.	Somewhat excessive.	0 to 12	Beds of acid marine sands underlain by finer sediments.	Weak.
Lakeland	Light olive-gray to very pale brown loamy sands to sands underlain by pale-brown sandy loam at a depth of 36 to 60 inches.	Upland slopes and ridges.	Somewhat excessive.	0 to 12	Sands and loamy sands of the Coastal Plain.	Weak.
Alluvial soils—						
Chewacla [1]	Reddish-brown silt loam underlain by mottled, gray silty clay at a depth of 10 to 20 inches.	Flood plain	Moderately good to somewhat poor.	0 to 2	Recent alluvium	Weak.

[1] Grades toward Low-Humic Gley soils.
[2] Grades toward Reddish-brown Lateritic soils.
[3] Grades toward Regosols.

series. In the following pages each great soil group represented in Twiggs County is described, as well as the soil series in the great soil group. Also described is a profile representative of each series. Unless otherwise stated, the description is that of a moist soil.

Red-Yellow Podzolic soils

This great soil group consists of well-developed, well-drained, acid soils formed under forest vegetation in a warm-temperate, humid climate. These soils have a thin organic A_0 and an organic-mineral A_1 horizon. The A_1 horizon is underlain by a light-colored, leached A_2 horizon, that, in turn, is underlain by a red, yellowish, or yellow B_2 horizon. The B_2 horizon contains more clay than the horizons above. Parent materials are all more or less siliceous. Coarse, reticulate streaks or mottles of red, yellow, brown, and light gray occur in the deep horizons. In most areas of Red-Yellow Podzolic soils in Twiggs County, the A_0 and A_1 horizons have been mixed by plowing to form an A_p horizon. In some of the steep unprotected areas, accelerated erosion has removed all or nearly all of the A horizon and has exposed the red or yellow B_2 horizon.

Generally, the soils of this group have a low cation-exchange capacity and a very low percentage of base saturation. Kaolinite is the dominant clay mineral. The subsoil is generally moderate to strong and subangular blocky in structure.

All the Red-Yellow Podzolic soils in Twiggs County originally had a dark-colored, thin A_1 horizon in which the organic-matter content was moderate to low. In uneroded areas they have a well-defined A_2 horizon with a weak, granular or crumb structure. The B_2 horizon is medium acid or strongly acid, has moderate or strong subangular blocky structure, and has much greater clay content than the A_2 horizon. The C horizon is mottled or reticulated red, yellow, and gray. Soil structure is usually weaker in this horizon than it is in the B_2 horizon, and the clay content is usually less.

RUSTON AND FACEVILLE SERIES

The Ruston soils and the Faceville soils are good examples of Red-Yellow Podzolic soils. These deep, well-drained soils have an A_2 horizon and a well-developed B horizon. The Ruston soils have a yellowish-red to red, friable sandy clay loam B_2 horizon, but the Faceville soils have a strong-brown to yellowish-red, friable or firm sandy clay B_2 horizon.

Profile of Ruston loamy sand, 2 to 5 percent slopes (east of Jeffersonville)—

- A_p 0 to 8 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; strongly acid; boundary clear, smooth.
- A_2 8 to 14 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary gradual, wavy.
- B_2 14 to 36 inches, yellowish-red (5YR 4/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; strongly acid; boundary gradual, wavy.
- B_3 36 to 40 inches, reddish-brown (2.5YR 4/4) sandy clay loam with few, fine, faint mottles of brownish yellow (10YR 6/8); moderate, medium, subangular blocky structure; friable; strongly acid; boundary gradual, wavy.
- C 40 to 60 inches +, red (10R 4/6) sandy clay loam with common, medium, distinct mottles of brownish yellow (10YR 6/8); moderate, medium, subangular blocky structure; friable to firm; strongly acid.

Profile of Faceville fine sandy loam, 2 to 5 percent slopes, eroded (on Mount Zion Church road in the southeastern part of the county)—

- A_p 0 to 3 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary gradual, wavy.
- A_2 3 to 9 inches, dark yellowish-brown (10YR 4/4) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary clear, smooth.
- B_1 9 to 16 inches, strong-brown (7.5YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; strongly acid; boundary clear, smooth.
- B_2 16 to 40 inches, strong-brown (7.5YR 5/8) sandy clay; moderate, medium, subangular blocky structure; friable to firm; strongly acid; boundary clear, smooth.
- B_3 40 to 52 inches, strong-brown (7.5YR 5/6) sandy clay with common, medium, distinct mottles of red (2.5YR 4/6) and yellowish brown (10YR 5/8); moderate, medium, blocky structure; firm; strongly acid; boundary gradual, wavy.
- C 52 to 60 inches +, strong-brown (7.5YR 5/6) sandy clay with many, coarse, prominent mottles of red (2.5YR 4/6), yellowish brown (10YR 5/8), and pale yellow (2.5Y 7/4); moderate, medium, blocky structure; extremely firm; very strongly acid.

NORFOLK AND TIFTON SERIES

The Norfolk soils and the Tifton soils are good examples of Red-Yellow Podzolic soils with yellowish-brown to strong-brown subsoils. These soils are deep and well drained. The B horizon in the Tifton soils is finer textured than that in Norfolk soils. Small, hard concretions of iron are on the surface of the Tifton soils and throughout the profile.

Profile of Norfolk loamy sand, 2 to 5 percent slopes (in a wooded area south of Jeffersonville on U.S. Highway No. 80)—

- A_p 0 to 7 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable to loose; strongly acid; boundary clear, smooth.
- A_2 7 to 11 inches, yellowish-brown (10YR 5/4) light sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary clear, wavy.
- B_{21} 11 to 24 inches, yellowish-brown (10YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable; strongly acid; boundary clear, wavy.
- B_{22} 24 to 40 inches, strong-brown (7.5YR 5/8) sandy clay loam; moderate, medium, subangular blocky structure; friable to firm when moist, slightly sticky when wet; strongly acid; boundary clear, wavy.
- C 40 inches +, brownish-yellow (10YR 6/6) sandy clay loam with many, coarse, prominent mottles of reddish yellow (7.5YR 6/8), red (2.5YR 4/8), and gray (10YR 6/1); moderate, medium, subangular blocky structure; strongly acid.

Profile of Tifton fine sandy loam, 2 to 5 percent slopes, eroded (southeastern part of the county east of Elsharah Church)—

- A_p 0 to 4 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; many small, hard, rounded concretions of iron; strongly acid; boundary clear, smooth.
- A_2 4 to 8 inches, yellowish-brown (10YR 5/6) fine sandy loam; weak, granular structure; very friable to loose; many small, rounded concretions of iron; strongly acid; boundary gradual, wavy.
- B_{21} 8 to 24 inches, yellowish-brown (10YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; many iron concretions; strongly acid; boundary gradual, wavy.

B_{22} 24 to 40 inches, strong-brown (7.5YR 5/8) sandy clay; moderate, medium, blocky structure; friable to firm; many small, rounded concretions of iron; strongly acid; boundary gradual, wavy.

C 40 to 50 inches +, strong-brown (7.5YR 5/6) sandy clay loam with common, medium, distinct mottles of brownish yellow (10Y 6/6), red (10R 4/6), and yellowish red (5YR 4/6); moderate, medium, subangular blocky structure; friable to firm; strongly acid.

OKTIBBEHA SERIES

Although Oktibbeha soils are moderately well drained Red-Yellow Podzolic soils, they are shallower and more weakly developed than are soils representative of the Red-Yellow Podzolic great soil group. They are underlain by marl or limestone. In parts of Twiggs County, an A_3 horizon, 1 or 2 inches thick, has developed. A thin weakly developed B_1 horizon occurs in some places.

Profile of an Oktibbeha fine sandy loam in an area of Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded (on State Route 96, about 2 miles east of the Southern Railroad)—

A 0 to 4 inches, dark reddish-brown (5YR 3/2) fine sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary clear, smooth.

B 4 to 20 inches, reddish-brown (2.5YR 4/4) clay; strong, medium, blocky structure; extremely firm; very hard when dry; medium to strongly acid; boundary clear, smooth.

C_{ca} 20 to 40 inches, light-gray (10YR 7/2) clay with common, medium, distinct mottles of pale brown (10YR 6/3) and grayish brown (10YR 5/2); lime concretions; strong, medium, blocky structure; very firm; extremely hard when dry; slightly alkaline; boundary gradual, wavy.

D_{ca} 40 to 50 inches +, white (N 8/0), calcareous clay with common, medium, distinct mottles of light gray (2.5Y 7/2) and olive yellow (2.5Y 6/6); extremely firm; extremely hard when dry; alkaline.

SUSQUEHANNA SERIES

The Susquehanna soils are somewhat poorly drained Red-Yellow Podzolic soils that have some characteristics of Regosols. They have a moderately coarse textured surface layer and in most places a very thin A_2 horizon. In some places the A_2 horizon is absent. The C horizon is very fine textured and highly mottled. These soils generally occur on moderately steep, eroded side slopes adjacent to drainageways. Their solum is thin, and their horizon development is not so distinct as it is in representative Red-Yellow Podzolic soils.

Profile of Susquehanna sandy loam, 2 to 8 percent slopes, eroded (at the intersection of Dry Branch road and State Route 57)—

A_p 0 to 4 inches, dark-gray (10YR 4/1) sandy loam with common, fine, faint mottles of grayish brown (10YR 5/2); weak, fine, granular structure; loose to very friable; many fine roots; strongly acid; boundary clear, smooth.

C_1 4 to 30 inches, mottled gray (N 5/0), red (2.5YR 4/8), and yellowish-brown (10YR 5/8) heavy clay; mottles are many, medium, and prominent; strong, medium, blocky structure; very plastic and sticky when wet, extremely hard when dry; clay skins on peds; few roots; strongly acid; boundary gradual, wavy.

C_2 30 to 72 inches, light brownish-gray (2.5Y 6/2) clay with common, medium, blocky structure; very sticky when wet, extremely hard when dry; few fine roots in upper part; strongly acid.

MAGNOLIA AND ORANGEBURG SERIES

Magnolia soils and Orangeburg soils are Red-Yellow Podzolic soils. These deep, well-drained soils have a leached A_2 horizon and a moderately fine textured B horizon. The A_2 horizon is very thin in Magnolia soils. Magnolia and Orangeburg soils are deep, well oxidized, and dark red in the lower part of the solum and, in this respect, are like Reddish-Brown Lateritic soils. Both podzolization and laterization have been active in forming these soils.

Profile of Magnolia sandy loam, 2 to 5 percent slopes, eroded (west of Jeffersonville on the Marion Church road)—

A_p 0 to 6 inches, grayish-brown (10YR 5/2) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary clear, smooth.

A_3 6 to 9 inches, yellowish-red (5YR 4/6) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary clear, smooth.

B_2 9 to 50 inches, red (10R 4/6) sandy clay; moderate, medium, blocky structure; firm; strongly acid; boundary gradual, irregular.

C 50 to 60 inches +, dark-red (10R 3/6) sandy clay with few, medium, distinct mottles of strong brown (7.5YR 5/6) and light yellowish brown (10YR 6/4); blocky structure; strongly acid.

Profile of Orangeburg loamy sand, 2 to 5 percent slopes (1 mile west of Bullard on a dirt road)—

A_p 0 to 6 inches dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; loose; strongly acid; boundary clear, smooth.

A_3 6 to 10 inches reddish-brown (5YR 4/4) loamy sand; weak, fine, granular structure; loose to very friable; strongly acid; boundary clear, smooth.

B_1 10 to 14 inches, dark-red (2.5YR 3/6) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary gradual, wavy.

B_2 14 to 72 inches +, dark red (10R 3/6) sandy clay loam; moderate, medium, subangular blocky structure; friable; very strongly acid.

IZAGORA AND LYNCHBURG SERIES

Izagora soils and Lynchburg soils are Red-Yellow Podzolic soils. The Izagora soils are moderately well drained. They have developed on terraces in alluvium that washed from soils on the surrounding upland of the Coastal Plain. The Lynchburg soils are somewhat poorly drained. They developed on uplands from acid loamy sand, sandy loam, and sandy clay.

The leaching of clay and other materials from the A_2 horizon of Izagora and Lynchburg soils, and the subsequent accumulation of these materials in the B horizon, is characteristic of Red-Yellow Podzolic soils. A somewhat poorly drained, mottled, gleyed layer in the Izagora and Lynchburg soils is characteristic of the Low-Humic Gley soils.

Profile of an Izagora sandy loam (in the western part of the county)—

A_p 0 to 6 inches, pale-brown (10YR 6/3) sandy loam; weak, fine, granular structure; very friable to loose; many roots; strongly acid; boundary gradual, wavy.

B_1 6 to 10 inches, yellowish-brown (10YR 5/8) sandy loam; weak, fine, subangular blocky structure; very friable; strongly acid to very strongly acid; many fine roots; boundary gradual, wavy.

B_2 10 to 30 inches, yellowish-brown (10YR 5/6) sandy clay loam with few, fine, prominent mottles of red (10R 4/6); moderate, medium, subangular blocky struc-

ture; friable when moist, hard when dry; strongly acid to very strongly acid; boundary gradual, wavy.

C 30 to 40 inches +, yellowish-brown (10YR 5/6) sandy clay with many, medium, prominent mottles of brownish yellow (10YR 6/6), very pale brown (10YR 7/3), and red (10R 4/6); moderate, medium, blocky structure; firm when moist, hard when dry; very strongly acid.

Profile of Lynchburg sandy loam, 0 to 2 percent slopes (in the southeastern part of the county)—

A 0 to 8 inches, dark-gray (10YR 4/1) to gray (10YR 5/1) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary clear, smooth.

A_2 8 to 18 inches, pale-yellow (2.5Y 7/4) loamy sand; single grain (structureless); loose; strongly acid; boundary clear, smooth.

B_2 18 to 32 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam with few, medium, distinct mottles of light gray (2.5Y 7/2) and pale yellow (2.5Y 7/4); moderate, medium, subangular blocky structure; strongly acid; boundary gradual, wavy.

C 32 to 40 inches +, light-gray (5Y 7/2) sandy clay loam with many, medium, prominent mottles of yellowish red (5YR 5/6), pale yellow (2.5Y 7/4), and dark red (10R 3/6); moderate, medium, subangular blocky structure; very strongly acid; more gray and less mottled with increasing depth.

Reddish-Brown Lateritic soils

This great soil group is in the zonal soil order. It consists of deep, highly weathered, well-drained, acid soils that formed under forest vegetation in a moist, warm-temperature or tropical climate. These soils have a dark reddish-brown, very friable A horizon and a dark-red, friable to firm, sandy clay B horizon. The B horizon is very thick and is underlain by a reticulately mottled, lateritic C horizon. Climate has been the dominant soil-forming factor. The soil profiles are highly weathered because rainfall has been heavy and summers long and hot. In Twiggs County the Greenville and Red Bay series are Reddish-Brown Lateritic soils, but their subsoil contains less clay than that of representative Reddish-Brown Lateritic soils.

GREENVILLE AND RED BAY SERIES

The Greenville soils and the Red Bay soils are deep and well drained. They have a dark reddish-brown layer but lack an eluvial A_2 horizon. The surface layer of these soils is underlain, at a depth that ranges from 7 to 21 inches, by a very thick, dark, reddish subsoil, which is as much as 10 feet thick in places. The Greenville soils are finer textured in the surface layer and the subsoil than the Red Bay soils. Generally, the soils of both series have a low cation-exchange capacity and a very low percentage of base saturation. Kaolinite is the dominant clay mineral. The structure of the subsoil is moderate to strong, subangular blocky to blocky.

Profile of Greenville sandy loam, 2 to 5 percent slopes (one-fourth mile west of Tarversville on State Route 96)—

A_p 0 to 7 inches, dark reddish-brown (5YR 3/3) sandy loam; weak, fine, granular structure; very friable to loose; many fine roots; strongly acid; boundary abrupt, smooth.

B_1 7 to 21 inches, dark reddish-brown (2.5YR 3/4) sandy clay loam; moderate, medium, subangular blocky structure; friable; few fine roots; strongly acid; boundary clear, smooth.

B_2 21 to 72 inches +, dark-red (10R 3/6) sandy clay; moderate, medium, blocky structure; friable to firm when moist, hard when dry; few fine roots in upper part; very strongly acid.

Profile of Red Bay loamy sand, 0 to 2 percent slopes (2 miles south of Bullard on U.S. Highway No. 129)—

A_p 0 to 7 inches, dark-brown (7.5YR 3/2) loamy sand; weak, fine, granular structure; loose or very friable; strongly acid; boundary clear, smooth.

B_1 7 to 17 inches, dusky-red (2.5YR 3/2) sandy loam; weak, fine, granular structure; very friable; strongly acid; boundary gradual, wavy.

B_2 17 to 40 inches, dark-red (2.5YR 3/6) sandy clay loam; moderate, medium, subangular blocky structure; many fine quartz grains; strongly acid; boundary gradual, wavy.

C 40 to 50 inches +, dark-red (2.5YR 3/6) sandy loam; weak, fine, granular structure; very friable; many fine quartz grains; strongly acid.

Low-Humic Gley soils

The Low-Humic Gley great soil group consists of poorly drained soils in the intrazonal order. They have a thin A horizon that contains a moderate amount of organic matter. The A horizon is underlain by a mottled gray and brown, weakly developed, gleyed horizon that differs little from the surface layer in texture. In Twiggs County the Grady and Wehadkee soils are in the Low-Humic Gley great soil group.

GRADY AND WEHADKEE SERIES

The soils in these series have a thin A_1 horizon and contain a moderate amount of organic matter. They are poorly drained, have a mottled, gleyed subsoil, and differ from each other chiefly in texture. In the Grady soils the surface layer is sandy loam, underlain by sandy clay; in the Wehadkee soils the surface layer and underlying materials are silty clay loam.

Profile of Grady sandy loam—

A_1 0 to 6 inches, very dark gray (10YR 3/1) sandy loam; weak fine, granular structure; very friable; strongly acid; boundary clear, smooth.

B_1 6 to 14 inches, grayish-brown (10YR 5/2) sandy clay loam with common, medium, faint mottles of yellowish brown (10YR 5/8); moderate, medium, subangular blocky structure; friable; strongly acid; boundary gradual, wavy.

B_2 14 to 26 inches, gray (10YR 6/1) sandy clay with common, medium, distinct mottles of yellowish brown (10YR 5/8); moderate, medium, blocky structure; sticky when wet, firm when moist; strongly acid; boundary gradual, wavy.

C 26 to 36 inches +, gray (10YR 6/1) sandy clay or clay with common, medium, distinct mottles of yellowish brown (10YR 5/8) and red (2.5YR 4/8); moderate, medium, blocky structure; very sticky when wet, extremely firm when moist, hard when dry; strongly acid.

Profile of Wehadkee silty clay loam (on the flood plain of the Ocmulgee River)—

A 0 to 6 inches, very dark gray (5Y 3/1) silty clay loam with few, fine, faint mottles of dark brown (7.5YR 3/2); weak, fine, granular structure; friable; very strongly acid; boundary gradual, smooth.

C_1 6 to 24 inches, gray (5Y 5/1) silty clay loam with common, medium, distinct mottles of strong brown (7.5YR 5/8) and dark reddish brown (5YR 3/4); weak, fine, granular structure; friable; very strongly acid; boundary gradual, wavy.

C_2 24 to 36 inches +, gray (5Y 5/1) silty clay loam with many, medium, prominent mottles of strong brown (7.5YR 5/8) and dark reddish brown (5YR 3/4); weak, fine, granular structure; friable; very strongly acid.

Rendzina soils

The Rendzina soils are intrazonal soils that developed under grass in a warm-temperate, humid climate. They have a dark, weakly developed A horizon that contains a moderate amount of organic matter and is directly underlain by a C horizon of chalk, marl, or limestone. In Twiggs County the Binnsville is the only series in the Rendzina great soil group.

BINNSVILLE SERIES

The Binnsville soils are shallow, moderately well drained alkaline soils on gently sloping ridgetops and side slopes. The A horizon is dark-gray to black clay and is underlain by marl or limestone at a depth of 6 to 8 inches. The chief clay mineral in these soils is montmorillonite. Binnsville soils are very fine textured throughout the profile and in places are strong and blocky in structure.

Profile of Binnsville clay, 2 to 8 percent slopes, eroded (in a borrow pit on the south side of State Route 96, 2 miles east of the Southern Railroad)—

A_1 0 to 6 inches, dark-gray (N 4/0) clay; weak, fine, granular structure; friable to firm when moist, hard when dry; calcareous to mildly alkaline; boundary clear, smooth.

D_r 6 to 60 inches +, light-gray (10YR 7/2) to brownish-yellow (10YR 6/8) marl.

Grumusols

The Grumusols are intrazonal soils that are dominated by montmorillonitic clays. These soils are typically clay in texture and lack eluvial and illuvial horizons. They have a moderate or strong, granular structure in the upper horizons. They swell greatly when they take in moisture and shrink greatly as they dry. When they shrink and swell, the soils crack and materials from the upper horizons drop down into the lower horizons. This process churns or mixes the soils continually and partly prevents horizon differentiation.

Grumusols may have a prominent A_1 horizon but lack a B horizon that has dominant colors. The colors in the B horizon generally have low chroma. Grumusols are not well drained.

The Eutaw soils are the only Grumusols in this county. These soils show the effect of gleying and are more poorly drained than typical Grumusols. Their moisture content changes sufficiently, however, for the soils to be churned or mixed.

Profile of a Eutaw fine sandy loam in an area of Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded (on State Route 96, about 2 miles east of the Southern Railroad)—

A_1 0 to 4 inches, black (5Y 2/1) fine sandy loam; weak, fine, subangular blocky structure; firm when moist, hard when dry; strongly acid; boundary gradual, wavy.

B 4 to 24 inches, gray (10YR 5/1) clay with few, fine, faint mottles of dark gray (10YR 4/1) and light gray (10YR 7/1); strong medium, blocky structure; extremely firm when moist; plastic when wet, very hard when dry; strongly acid; boundary gradual, wavy.

D 24 to 40 inches +, white (N 8/0), calcareous clay with common, medium, distinct mottles of pale yellow (2.5Y 7/4); strong, medium, blocky structure; extremely firm when moist, very hard when dry; slightly alkaline.

Planosols

Planosols have an eluviated surface horizon underlain by a B horizon that is more strongly illuviated or compacted than the corresponding horizon in nearby zonal soils. The Planosols developed on nearly level uplands under grass or forest vegetation. The climate is humid or subhumid. Characteristic of the Planosols is their somewhat restricted drainage and, at variable depths, a well-defined layer of clay (argipan) or a compact, brittle, medium-textured layer (fragipan).

The Wahee soils are the only Planosols in Twiggs County. These soils have an argipan. Their surface layer grades abruptly to a firm B horizon that is high in clay.

WAHEE SERIES

The Wahee soils are Planosols with an argipan. They developed on terraces in old alluvium that washed from soils on the surrounding uplands. Wahee soils are gleyed and poorly drained in the lower part of the subsoil. The sandy surface layer grades quite abruptly to the clayey subsoil.

Profile of Wahee loamy sand (one-fourth mile south of Westlake on the west side of the railroad)—

A_p 0 to 6 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; loose; medium acid to strongly acid; boundary gradual, smooth.

B_2 6 to 10 inches, yellowish-brown (10YR 5/4) sandy clay with few, fine, faint mottles of pale brown (10YR 6/3) and red (2.5YR 4/6); moderate, medium, blocky structure; firm when moist, hard when dry; strongly acid; boundary gradual, wavy.

B_3 10 to 27 inches, yellowish-brown (10YR 5/4) sandy clay to clay with common, fine, distinct mottles of red (10R 4/8) and light brownish gray (10YR 6/2); strong, medium, blocky structure; firm when moist, very hard when dry; few mica flakes; very strongly acid; boundary gradual, wavy.

C 27 to 37 inches +, light brownish-gray (10YR 6/2) sandy clay to clay with many, medium, prominent mottles of red (10R 4/8) and yellowish brown (10YR 5/6) strong, medium, blocky structure; very firm when moist, very hard when dry; some mica flakes; very strongly acid.

Regosols

Regosols are in the azonal soil order. They consist of deep, unconsolidated materials in which few or no distinct soil characteristics have developed. The structural and textural characteristics of a B horizon are absent. These soils are generally on recent sand dunes and in loess and glacial drift on steep slopes. In Twiggs County the Regosols are the soils of the Lakeland, Eustis, and Americus series.

LAKELAND, EUSTIS, AND AMERICUS SERIES

The Lakeland, Eustis, and Americus soils are on level to sloping uplands. They are somewhat excessively drained and have formed from acid marine sands of the Coastal Plain. Like other Regosols, Lakeland soils have very weak profile development and no B horizon. Their thin profiles are lighter colored and more yellowish than those of the Eustis and Americus soils. The Eustis soils have a dark grayish-brown to reddish-brown, loamy sand to sand A horizon that is 20 to 60 inches thick or more. They are underlain by a strong-brown to yellowish-red and reddish-brown, sandy loam to sandy clay loam C

horizon. Americus soils have a dark-brown surface soil and a dark reddish-brown subsoil.

Profile of Lakeland sands, 0 to 5 percent slopes (4 miles southwest of Danville on Cool Springs road)—

A_p 0 to 6 inches, light olive-gray (5Y 6/2) sand; single grain (structureless); loose; few iron concretions on surface; strongly acid; boundary clear, smooth.

A_{12} 6 to 22 inches, very pale brown (10YR 7/3) sand; single grain (structureless); loose; few fine roots; strongly acid; boundary gradual, irregular.

C 22 to 60 inches +, pale-brown (10YR 6/3) sand with few, fine, faint mottles of light yellowish brown (10YR 6/4) and very pale brown (10YR 7/3); single grain (structureless); loose; few fine roots; very strongly acid.

Profile of Eustic loamy sand, shallow, 0 to 5 percent slopes (southeast of Jeffersonville on State Route 127)—

A_p 0 to 7 inches, dark grayish brown (10YR 4/2) loamy sand; weak, fine, crumb structure; loose; medium acid to strongly acid; boundary abrupt, smooth.

A_2 7 to 16 inches, grayish-brown (10YR 5/2) loamy sand; single grain (structureless); loose; very strongly acid; gradual, wavy boundary.

A_3 16 to 23 inches, dark yellowish-brown (10YR 4/4) loamy sand; single grain (structureless); loose; strongly acid; boundary gradual, wavy.

C_1 23 to 40 inches, strong-brown (7.5YR 5/8) loamy sand; weak, fine, crumb structure; loose to very friable; few fine roots; strongly acid; boundary gradual, wavy.

C_2 40 to 64 inches, strong-brown (7.5YR 5/8) sandy loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; boundary gradual, wavy.

C_3 64 to 72 inches +, yellowish-red (5YR 4/8) sandy loam with common, medium, distinct mottles of yellowish brown (10YR 5/8); weak, fine, granular structure; very friable; few fine roots in upper part; strongly acid.

Profile of Americus loamy sand, 2 to 5 percent slopes (2.5 miles west of Marion Church on Marion road)—

A_p 0 to 6 inches, dark-brown (7.5YR 3/2) loamy sand; granular structure; loose; strongly acid; boundary clear, smooth.

A_2 6 to 9 inches, dark reddish-brown (2.5YR 3/4) loamy sand; granular structure; very friable to loose; strongly acid; boundary clear, wavy.

C 9 to 98 inches, dark-red (2.5YR 3/6) loamy sand; weak, fine, granular structure; loose; strongly acid.

Alluvial soils

Alluvial soils are in the azonal soil order. They consist of alluvium that was transported and deposited fairly recently and has been changed little by the soil-forming processes. A distinct B horizon has not developed. The Chewacla soils in Twiggs County are in the Alluvial great soil group but grade toward Low-Humic Gley soils.

CHEWACLA SERIES

The Chewacla soils are nearly level, somewhat poorly drained Alluvial soils on flood plains. Except for a gley-like mineral horizon at a depth of about 10 to 20 inches, the horizons in these soils differ little.

Profile of Chewacla silt loam (south side of State Route 96, at a bridge over the Ocmulgee River)—

A_{11} 0 to 6 inches, reddish-brown (5YR 4/4) silt loam; weak fine, granular structure; very friable; many roots; strongly acid; boundary gradual, wavy.

A_{12} 6 to 16 inches, reddish-brown (5YR 4/4) silty clay loam; weak, fine, granular structure; friable; few light-gray mottles; strongly acid; boundary gradual, smooth.

C 16 to 26 inches +, gray (10YR 6/1) silty clay with many, medium, distinct mottles of strong brown (7.5YR 5/6); weak, fine, granular structure; firm when moist; hard when dry; strongly acid.

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Glossary

Alluvium (alluvial deposits). Soil material, such as sand, silt, or clay, deposited on land by streams.

Calcareous soil. (See also Reaction, soil.) A soil containing calcium carbonate, in many places mixed with magnesium carbonate, in such quantities as to effervesce visibly when dilute hydrochloric acid is applied. A calcareous soil has an alkaline reaction.

Clay. As a soil separate, the mineral grains less than 0.002 millimeter (0.000079 inch) in diameter. (See also Texture.)

Colluvium (colluvial deposits). Soil material, rock fragments, or both, moved by creep, slides, or local wash, and deposited at the base of steep slopes.

Complex, soil. A mapping unit consisting of different kinds of soil that occur in small individual areas or in such an intricate pattern that they cannot be shown separately on a publishable soil map.

Concretions. Hard grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds that cement the soil grains together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of materials commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. The terms commonly used to describe consistence are—

Cemented. Hard and brittle; the soil is little affected by moistening.

Friable. When moist, the soil is easily crushed by hand and coheres when pressed together. Friable soils are easily tilled.

Firm. When moist, the soil crushes under moderate pressure but resistance is distinctly noticeable. Firm soils are likely to be difficult to till.

Hard. When dry, the soil is moderately resistant to pressure, can be broken in the hands without difficulty, but is barely breakable between the thumb and forefinger.

Loose. Soil is noncoherent when moist or dry. Loose soils are generally coarse textured and are easily tilled.

Plastic. When wet, the soil retains an impressed shape and resists being deformed; plastic soils are high in clay and are difficult to till.

Soft. Weakly coherent and fragile; when dry, the soil breaks to powder or individual grains under slight pressure.

Sticky. After pressure, the soil adheres to both thumb and forefinger and tends to stretch somewhat rather than pull free from either finger; adhesive when wet but very cohesive when dry; decided tendency when wet to adhere to other material and to objects.

Field moisture capacity. The moisture content of a soil, expressed as percentage of oven-dry weight, after the gravitational or free water has been allowed to drain, usually 2 or 3 days after a soaking rain. Also called *normal field capacity, normal moisture capacity,* and *capillary capacity.*

Flood plain. Nearly level land that is at the bottom of a stream valley and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon that contains very little organic matter and clay but much silt or very fine sand. The layer appears to be cemented when dry, has hard or very hard consistence, and has higher bulk density than the horizon above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick, and they generally occur below the B horizon, 15 to 40 inches from the surface.

Gleization. The process of soil formation that causes a gleyed horizon to develop in the lower solum. The gleyed horizon develops as a result of waterlogging and lack of oxygen. It is ordinarily bluish gray or olive gray, sticky, compact, and typically structureless. Gleization is important in the formation of Low-Humic Gley soils.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. The following lists the several soil horizons in the order that they occur from the surface downward in a typical soil horizon.

- A_0 Organic debris, partly decomposed or matted.
- A_1 A dark-colored horizon having a fairly high content of organic matter mixed with mineral matter.
- A_2 A light-colored horizon that, where podzolized, is often the zone of maximum leaching; absent in wet, dark-colored soils. (See also Podzolization.)
- A_3 Transitional to B horizon but more like A than B; sometimes absent.
- B_1 Transitional to B horizon, but more like B than A; sometimes absent.
- B_2 A usually deeper colored horizon that, where podzolized, is often the zone of maximum illuviation.
- B_3 Transitional to C horizon.
- C Slightly weathered parent material; absent in some soils.
- D Underlying substratum.

The A horizons make up a zone of eluviation, which is the leached zone. The B horizons make up a zone of illuviation, in which clay and other materials have accumulated. The A and B horizons, taken together, are called the *solum* or *true soil.*

Humus. Well-decomposed organic matter; the more or less stable part of the organic matter in soils.

Mottled. Irregularly marked with spots that vary in color, number, and size. Mottling usually indicates poor aeration and lack of drainage. Descriptive terms are: contrast—*faint, distinct,* and *prominent;* abundance—*few, common,* and *many;* and size—*fine, medium,* and *coarse.* The size measurements are: fine, less than 5 millimeters (about 0.2 inch) along their greatest dimension; medium, between 5 and 15 millimeters (about 0.2 to 0.6 inch) along their greatest dimension; and coarse, more than 15 millimeters (about 0.6 inch) along their greatest dimension.

Phase, soil. A subdivision of a soil type or any other category of soil classification that is made on the basis of differences in the soil that affect management. A soil type, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects management but does not affect the classification of the soil in the landscape.

Podzolization. The process by which soils are depleted of bases, become more acid, and develop leached surface layers from which clay has been removed.

Profile, soil. A vertical section of the soil from the surface into the parent material. (See also Horizon, soil.)

Reaction, soil. The degree of acidity or alkalinity of a soil mass technically expressed in pH values and in words as follows:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4–7.8
Very strongly acid	4.5–5.0	Moderately alkaline	7.9–8.4
Strongly acid	5.1–5.5	Strongly alkaline	8.5–9.0
Medium acid	5.6–6.0	Very strongly alkaline	9.1 and higher.
Slightly acid	6.1–6.5		
Neutral	6.6–7.3		

Relief. Elevations or inequalities of the land surface, considered collectively.

Sand. As a soil separate, the rock or mineral fragments that range in diameter from 0.05 millimeter (0.002 inch) to 2.0 millimeters (0.079 inch). (See also Texture.)

Series, soil. A group of soils that developed from the same kind of parent material and have horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Silt. As a soil separate, particles that range in diameter between the largest size of clay, 0.002 millimeter (0.000079 inch), and the smallest size of very fine sand, 0.05 millimeter (0.002 inch). (See also Texture.)

Site index (Forestry). A numerical means of expressing the quality of the forest site that is based on the height of the dominant stand at an arbitrarily chosen age; for example, the average height attained by dominant and codominant trees in stocked stands at the age of 50 years.

Solum (plural—sola). That part of the soil profile above the parent material in which the processes of soil formation are active. The solum in mature soils includes the A and the B horizons, which generally have characteristics unlike those of the underlying parent material. The living roots and other plant or animal life in the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. That part of the soil below plow depth in which roots normally grow.

Surface soil. That part of the soil ordinarily moved in tillage, or the equivalent in uncultivated soil; about 5 to 8 inches in thickness; the plowed layer.

Texture, soil. Property of soil that is determined by the relative proportions of the various size classes of individual grains in a mass of soil. Specifically, the proportions of sand, silt, and clay. Following are definitions of soil textural classes:

Sand. Soil material that is 85 percent or more of sand; the percentage of silt, plus 1½ times the percentage of clay, shall not exceed 15.

Loamy sand. Soil material that, at the upper limit, is 85 to 90 percent sand, and the percentage of silt plus 1½ times the percentage of clay is not less than 15; and at the lower limit, is not less than 70 to 85 percent sand, and the percentage of silt plus twice the percentage of clay does not exceed 30.

Sandy loam. Soil material that is (1) 20 percent clay or less, and the percentage of silt plus twice the percentage of clay exceeds 30, and 52 percent or more sand; or (2) less than 7 percent clay, less than 50 percent silt, and between 43 percent and 52 percent sand.

Loam. Soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.

Silt loam. Soil material that is (1) 50 percent or more silt and 12 to 27 percent clay, or (2) 50 to 80 percent silt and less than 12 percent clay.

Silt. Soil material that is 80 percent or more silt and less than 12 percent clay.

Sandy clay loam. Soil material that is 20 to 35 percent clay, less than 28 percent silt, and 45 percent or more sand.

Clay loam. Soil material that is 27 percent to 40 percent clay and 20 to 45 percent sand.

Silty clay loam. Soil material that is 27 to 40 percent clay and less than 20 percent sand.

Sandy clay. Soil material that is 35 percent or more clay and 45 percent or more sand.

Silty clay. Soil material that is 40 percent or more clay and 40 percent or more silt.

Clay. Soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Type, soil. A subdivision of the soil series that is made on the basis of differences in the texture of the surface layer.

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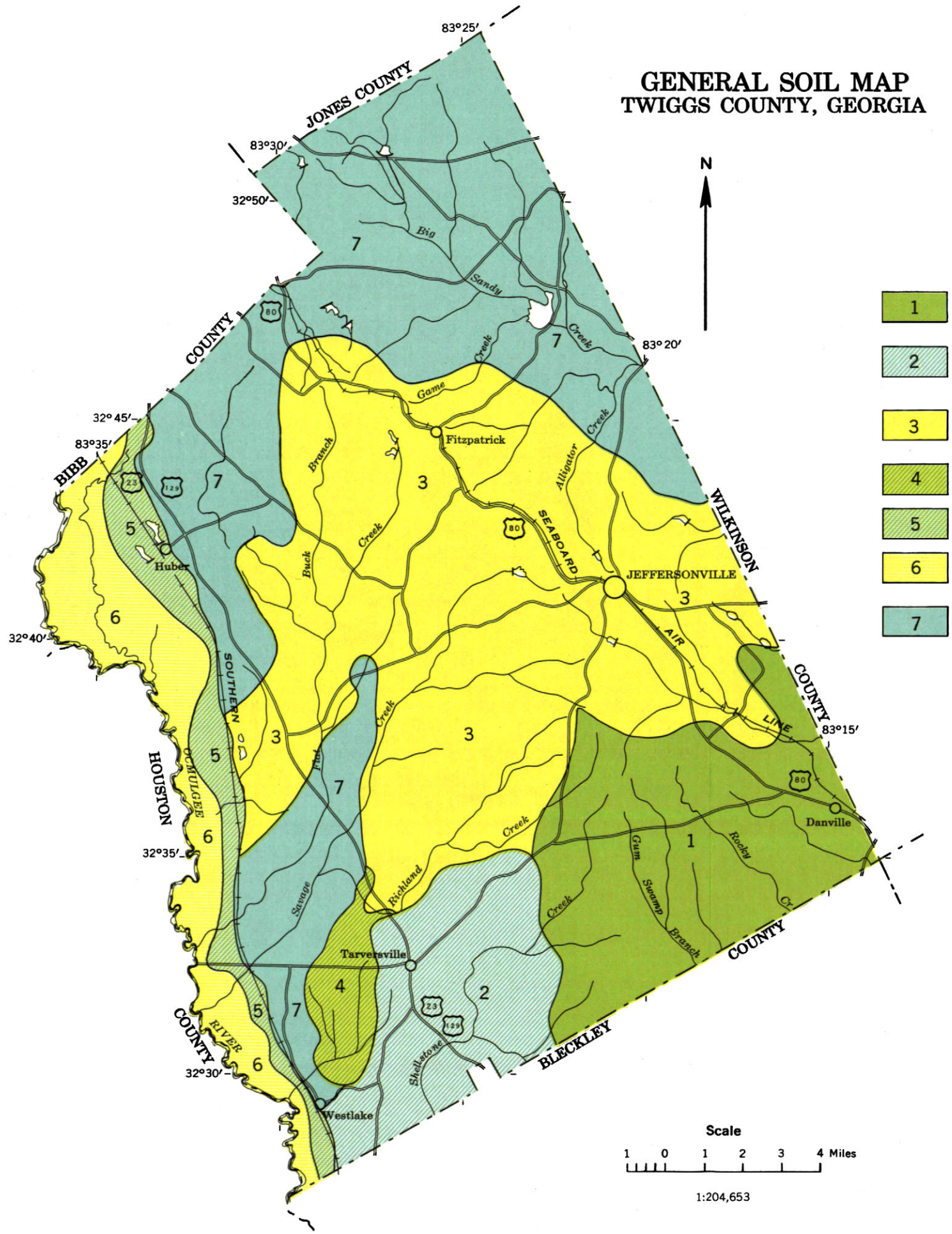
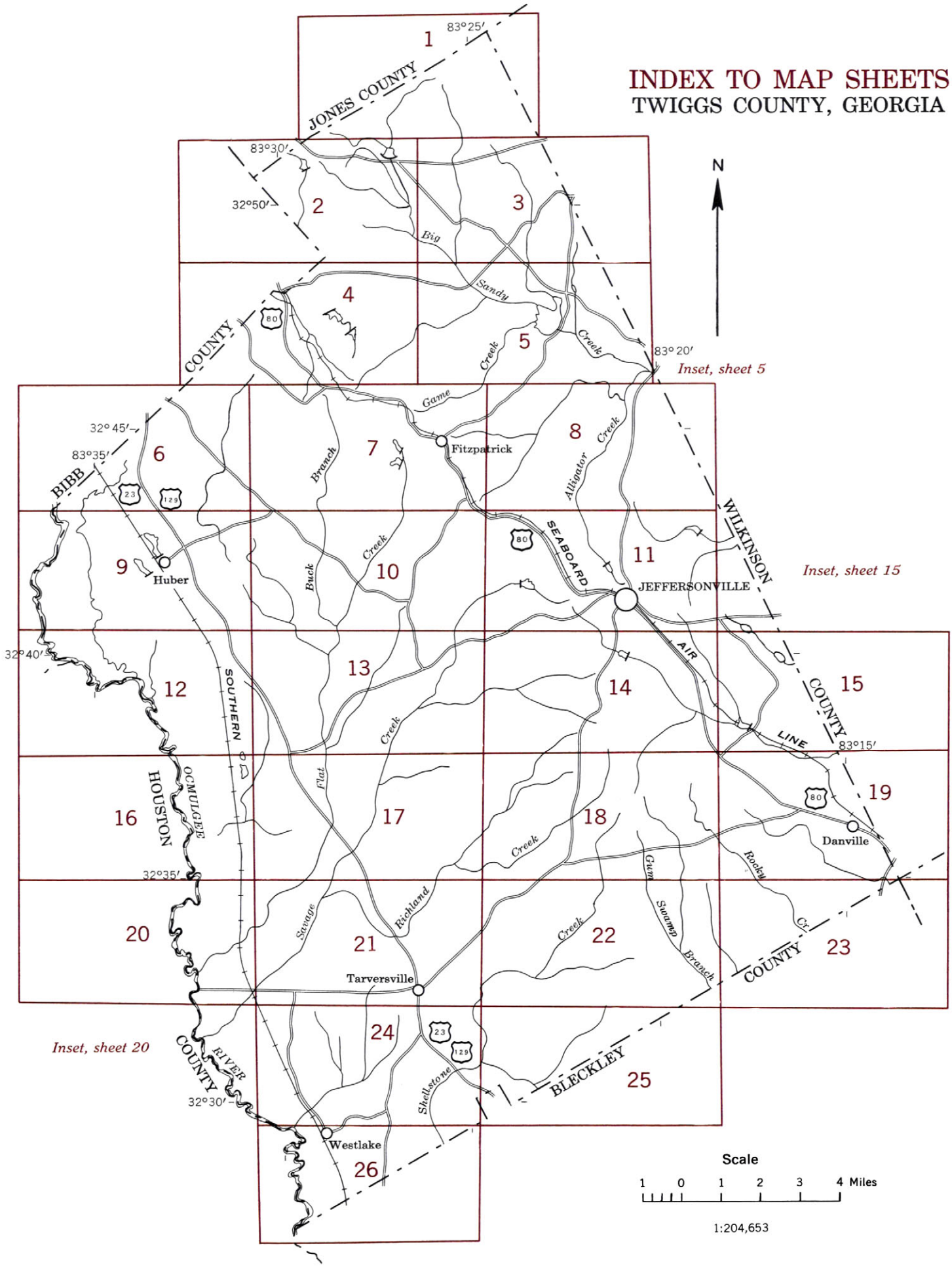
GENERAL SOIL MAP
TWIGGS COUNTY, GEORGIA



SOIL ASSOCIATIONS

1. Norfolk-Ruston-Tifton association: Well-drained soils on long, broad, level to gently sloping interstream divides
2. Greenville-Magnolia-Faceville association: Sandy loams on broad, level to gently sloping ridgetops and strongly sloping to steep side slopes
3. Orangeburg-Red Bay-Americus association: Well-drained, reddish sandy loams and loamy sands on long, narrow, gently sloping to steep ridgetops, and on side slopes
4. Oktibbeha-Eutaw-Susquehanna-Binnsville association: Soils on ridges underlain by limestone, marl, or chalk, and on slopes
5. Lakeland-Izagora-Wahee association: Level to very gently sloping, sandy soils on stream terraces
6. Chewacla-Wehadkee association: Narrow, level, somewhat poorly drained soils on flood plains along the Ocmulgee River
7. Lakeland-Eustis association: Somewhat excessively drained sands on broad, gently sloping divides, and sands over clay on knolls, ridges, and slopes


INDEX TO MAP SHEETS
TWIGGS COUNTY, GEORGIA
N
83°25′
83°30′
83°20′
32°50′
32°45′
83°35′
32°40′
32°35′
32°30′
83°15′
JONES COUNTY
BIBB COUNTY
WILKINSON COUNTY
HOUSTON COUNTY
BLECKLEY COUNTY
PEACH COUNTY
RIVER
Inset, sheet 5
Inset, sheet 15
Inset, sheet 20
1
2
3
4
5
6
7
8
9
10
11
12
13
14
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16
17
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19
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21
22
23
24
25
26
Big Sandy Creek
Game Branch
Alligator Creek
Buck Creek
Flat Creek
Savage Creek
Richland Creek
Gum Swamp Branch
Rocky Cr
Shellstone
Fitzpatrick
Huber
JEFFERSONVILLE
Tarversville
Danville
Westlake
SEABOARD
SOUTHERN
AIR LINE
OCMULGEE
80
23
129
Scale
1 0 1 2 3 4 Miles
1:204,653

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

TWIGGS COUNTY, GEORGIA

UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATIONS

SOIL LEGEND

The first letter in each symbol is the initial one of the soil name. If the third letter is a capital, it denotes the range of slope from A, less than 2 percent, to F, 17 to 30 percent. A number after the slope letter denotes the class of erosion as given in the soil name. Some of the symbols that do not contain a slope letter are symbols for nearly level soils, not more than slightly eroded. Gul, Gullied land, Mpd, Mine pits and dumps, and Sok, Sands over kaolinitic deposits, are land types that have a considerable range of slope.

SYMBOL	NAME
ArB	Americus loamy sand, 2 to 5 percent slopes
BuB2	Binnsville clay, 2 to 8 percent slopes, eroded
Csl	Chewacla silt loam
ErB	Eustis sand, 2 to 5 percent slopes
ErC	Eustis sand, 5 to 8 percent slopes
ErD	Eustis sand, 8 to 12 percent slopes
EsB	Eustis loamy sand, shallow, 0 to 5 percent slopes
EsC	Eustis loamy sand, shallow, 5 to 8 percent slopes
Eus	Eustis sand, terrace
FoB2	Faceville fine sandy loam, 2 to 5 percent slopes, eroded
FoC2	Faceville fine sandy loam, 5 to 8 percent slopes, eroded
GoA	Greenville sandy loam, 0 to 2 percent slopes
GoB	Greenville sandy loam, 2 to 5 percent slopes
GoB2	Greenville sandy loam, 2 to 5 percent slopes, eroded
GoC2	Greenville sandy loam, 5 to 8 percent slopes, eroded
GoD2	Greenville sandy loam, 8 to 12 percent slopes, eroded
GpD3	Greenville clay loam, 8 to 12 percent slopes, severely eroded
GpE3	Greenville clay loam, 12 to 17 percent slopes, severely eroded
GpF3	Greenville clay loam, 17 to 30 percent slopes, severely eroded
Gra	Grady sandy loam
Gul	Gullied land
Iza	Izagora sandy loam
Lak	Lakeland sand, terrace
Lcm	Local alluvial land
Lcn	Local alluvial land, wet
LoB	Lakeland loamy sands, shallow, 2 to 5 percent slopes
LoC	Lakeland loamy sands, shallow, 5 to 8 percent slopes
LpB	Lakeland sands, 0 to 5 percent slopes
LpC	Lakeland sands, 5 to 8 percent slopes
LpD	Lakeland sands, 8 to 12 percent slopes
LtA	Lynchburg sandy loam, 0 to 2 percent slopes
Mpd	Mine pits and dumps
MxA	Magnolia sandy loam, 0 to 2 percent slopes
MxB2	Magnolia sandy loam, 2 to 5 percent slopes, eroded
MxC2	Magnolia sandy loam, 5 to 8 percent slopes, eroded
NfB	Norfolk loamy sand, thick surface, 2 to 5 percent slopes
NfC	Norfolk loamy sand, thick surface, 5 to 8 percent slopes
NhA	Norfolk loamy sand, 0 to 2 percent slopes
NhB	Norfolk loamy sand, 2 to 5 percent slopes
NhB2	Norfolk loamy sand, 2 to 5 percent slopes, eroded
NhC2	Norfolk loamy sand, 5 to 8 percent slopes, eroded
NiB2	Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded
NiC2	Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded
NiD2	Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded
OcC3	Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded
OcD3	Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded
OcE3	Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded
OcF3	Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded
OdB	Orangeburg loamy sand, thick surface, 2 to 5 percent slopes
OdC	Orangeburg loamy sand, thick surface, 5 to 8 percent slopes
OeA	Orangeburg loamy sand, 0 to 2 percent slopes
OeB	Orangeburg loamy sand, 2 to 5 percent slopes
OeB2	Orangeburg loamy sand, 2 to 5 percent slopes, eroded
OeC2	Orangeburg loamy sand, 5 to 8 percent slopes, eroded
OeD2	Orangeburg loamy sand, 8 to 12 percent slopes, eroded
OeE2	Orangeburg loamy sand, 12 to 17 percent slopes, eroded
OfB2	Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded
OfD2	Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded
RgA	Red Bay loamy sand, 0 to 2 percent slopes
RgB	Red Bay loamy sand, 2 to 5 percent slopes
RgB2	Red Bay loamy sand, 2 to 5 percent slopes, eroded
RgC2	Red Bay loamy sand, 5 to 8 percent slopes, eroded
RgD2	Red Bay loamy sand, 8 to 12 percent slopes, eroded
RiB	Ruston loamy sand, 2 to 5 percent slopes
RiB2	Ruston loamy sand, 2 to 5 percent slopes, eroded
RiC2	Ruston loamy sand, 5 to 8 percent slopes, eroded
RjB	Ruston loamy sand, thick surface, 2 to 5 percent slopes
RjC	Ruston loamy sand, thick surface, 5 to 8 percent slopes
SiC2	Susquehanna sandy loam, 2 to 8 percent slopes, eroded
SiE2	Susquehanna sandy loam, 8 to 17 percent slopes, eroded
SjC3	Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded
SjD3	Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded
SkC2	Sandy and clayey land, gently sloping, eroded
SkD2	Sandy and clayey land, sloping, eroded
SkE3	Sandy and clayey land, strongly sloping, severely eroded
Sok	Sands over kaolinitic deposits
Swa	Swamp
TtB	Tifton fine sandy loam, 2 to 5 percent slopes
TtB2	Tifton fine sandy loam, 2 to 5 percent slopes, eroded
TtC2	Tifton fine sandy loam, 5 to 8 percent slopes, eroded
Wah	Wahee loamy sand
Wat	Wahee loamy sand, thick surface
Weh	Wehadkee silty clay loam
Wtl	Wet alluvial land

Soil map constructed 1961 by Cartographic Division, Soil Conservation Service, USDA, from 1955 aerial photographs. Controlled mosaic based on Georgia plane coordinate system, west zone, transverse Mercator projection. 1927 North American datum.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferries
- Ford
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Station

Mines and Quarries
- Mine dump
- Pits, gravel or other

Power lines

Pipe lines

Cemeteries

Dams

Levees

Tanks

Oil wells

Forest fire or lookout station

Sawmill

BOUNDARIES

- National or state
- County
- Township, U. S.
- Section line, corner
- Reservation
- Land grant

DRAINAGE

Streams
- Perennial
- Intermittent, unclass.

Canals and ditches (CANAL, DITCH)

Lakes and ponds
- Perennial
- Intermittent

Wells (flowing)

Springs

Marsh

Wet spot

RELIEF

Escarpments
- Bedrock
- Other

Prominent peaks

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

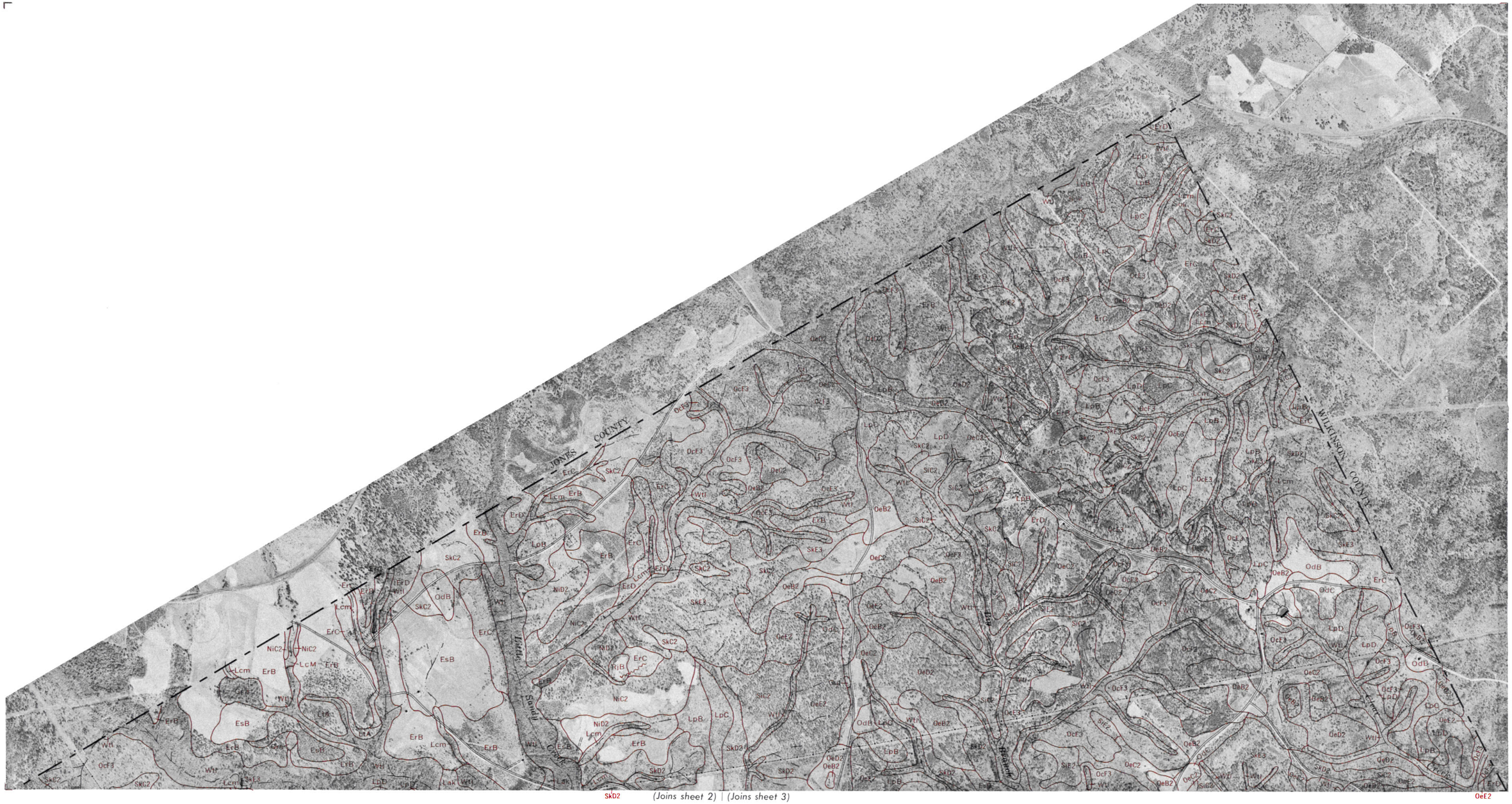
- Soil boundary and symbol (Dx)
- Gravel
- Stones
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gullies

GUIDE TO MAPPING UNITS

Map symbol	Mapping unit	Page	Capability unit		Woodland group	
			Symbol	Page	Number	Page
ArB	Americus loamy sand, 2 to 5 percent slopes	7	IIIs–1	31	4	42
BuB2	Binnsville clay, 2 to 8 percent slopes, eroded	9	VIe–3	34	(1)	--
Csl	Chewacla silt loam	9	IIIw–3	30	3	42
ErB	Eustis sand, 2 to 5 percent slopes	10	IVs–1	33	5	43
ErC	Eustis sand, 5 to 8 percent slopes	10	IVs–1	33	5	43
ErD	Eustis sand, 8 to 12 percent slopes	10	VIs–1	34	5	43
EsB	Eustis loamy sand, shallow, 0 to 5 percent slopes	10	IIIs–1	31	4	42
EsC	Eustis loamy sand, shallow, 5 to 8 percent slopes	10	IVs–1	33	4	42
Eus	Eustis sand, terrace	10	IVs–1	33	5	43
FoB2	Faceville fine sandy loam, 2 to 5 percent slopes, eroded	11	IIe–2	26	1	41
FoC2	Faceville fine sandy loam, 5 to 8 percent slopes, eroded	11	IIIe–2	28	1	41
GoA	Greenville sandy loam, 0 to 2 percent slopes	12	I–2	25	1	41
GoB	Greenville sandy loam, 2 to 5 percent slopes	12	IIe–2	26	1	41
GoB2	Greenville sandy loam, 2 to 5 percent slopes, eroded	12	IIe–2	26	1	41
GoC2	Greenville sandy loam, 5 to 8 percent slopes, eroded	12	IIIe–2	28	1	41
GoD2	Greenville sandy loam, 8 to 12 percent slopes, eroded	12	IVe–2	32	1	41
GpD3	Greenville clay loam, 8 to 12 percent slopes, severely eroded	12	VIe–1	34	1	41
GpE3	Greenville clay loam, 12 to 17 percent slopes, severely eroded	12	VIIe–1	35	1	41
GpF3	Greenville clay loam, 17 to 30 percent slopes, severely eroded	12	VIIe–1	35	1	41
Gra	Grady sandy loam	11	IIIw–2	30	3	42
Gul	Gullied land	13	VIIe–3	35	(1)	--
Iza	Izagora sandy loam	13	IIw–2	27	2	42
Lak	Lakeland sand, terrace	14	IVs–1	33	5	43
Lcm	Local alluvial land	14	IIw–1	27	2	42
Lcn	Local alluvial land, wet	14	Vw–2	33	3	42
LoB	Lakeland loamy sands, shallow, 2 to 5 percent slopes	13	IIIs–1	31	4	42
LoC	Lakeland loamy sands, shallow, 5 to 8 percent slopes	13	IVs–1	33	4	42
LpB	Lakeland sands, 0 to 5 percent slopes	13	IVs–1	33	5	43
LpC	Lakeland sands, 5 to 8 percent slopes	13	IVs–1	33	5	43
LpD	Lakeland sands, 8 to 12 percent slopes	13	VIs–1	34	5	43
LtA	Lynchburg sandy loam, 0 to 2 percent slopes	14	IIw–2	27	2	42
Mpd	Mine pits and dumps	15	(2)	--	(1)	--
MxA	Magnolia sandy loam, 0 to 2 percent slopes	15	I–2	25	1	41
MxB2	Magnolia sandy loam, 2 to 5 percent slopes, eroded	14	IIe–2	26	1	41
MxC2	Magnolia sandy loam, 5 to 8 percent slopes, eroded	15	IIIe–2	28	1	41
NfB	Norfolk loamy sand, thick surface, 2 to 5 percent slopes	16	IIs–1	27	1	41
NfC	Norfolk loamy sand, thick surface, 5 to 8 percent slopes	16	IIIe–5	29	1	41
NhA	Norfolk loamy sand, 0 to 2 percent slopes	15	I–1	25	1	41
NhB	Norfolk loamy sand, 2 to 5 percent slopes	15	IIe–1	26	1	41
NhB2	Norfolk loamy sand, 2 to 5 percent slopes, eroded	15	IIe–1	26	1	41
NhC2	Norfolk loamy sand, 5 to 8 percent slopes, eroded	15	IIIe–1	28	1	41
NiB2	Norfolk loamy sand, thin solum, 2 to 5 percent slopes, eroded	16	IIe–1	26	1	41
NiC2	Norfolk loamy sand, thin solum, 5 to 8 percent slopes, eroded	16	IIIe–1	28	1	41
NiD2	Norfolk loamy sand, thin solum, 8 to 12 percent slopes, eroded	16	IVe–1	31	1	41
OcC3	Orangeburg sandy loam, 5 to 8 percent slopes, severely eroded	18	IVe–1	31	1	41
OcD3	Orangeburg sandy loam, 8 to 12 percent slopes, severely eroded	18	VIe–1	34	1	41
OcE3	Orangeburg sandy loam, 12 to 17 percent slopes, severely eroded	18	VIIe–1	35	1	41
OcF3	Orangeburg sandy loam, 17 to 30 percent slopes, severely eroded	18	VIIe–1	35	1	41
OdB	Orangeburg loamy sand, thick surface, 2 to 5 percent slopes	18	IIs–1	27	1	41
OdC	Orangeburg loamy sand, thick surface, 5 to 8 percent slopes	18	IIIe–5	29	1	41
OeA	Orangeburg loamy sand, 0 to 2 percent slopes	17	I–1	25	1	41
OeB	Orangeburg loamy sand, 2 to 5 percent slopes	17	IIe–1	26	1	41
OeB2	Orangeburg loamy sand, 2 to 5 percent slopes, eroded	17	IIe–1	26	1	41
OeC2	Orangeburg loamy sand, 5 to 8 percent slopes, eroded	17	IIIe–1	28	1	41
OeD2	Orangeburg loamy sand, 8 to 12 percent slopes, eroded	18	IVe–1	31	1	41
OeE2	Orangeburg loamy sand, 12 to 17 percent slopes, eroded	18	VIe–1	34	1	41
OfB2	Oktibbeha-Eutaw-Susquehanna complex, 2 to 5 percent slopes, eroded	16	IVe–4	32	(1)	--
OfD2	Oktibbeha-Eutaw-Susquehanna complex, 5 to 12 percent slopes, eroded	17	VIe–2	34	(1)	--
RgA	Red Bay loamy sand, 0 to 2 percent slopes	18	I–1	25	1	41
RgB	Red Bay loamy sand, 2 to 5 percent slopes	19	IIe–1	26	1	41
RgB2	Red Bay loamy sand, 2 to 5 percent slopes, eroded	19	IIe–1	26	1	41
RgC2	Red Bay loamy sand, 5 to 8 percent slopes, eroded	19	IIIe–1	28	1	41
RgD2	Red Bay loamy sand, 8 to 12 percent slopes, eroded	19	IVe–1	31	1	41
RiB	Ruston loamy sand, 2 to 5 percent slopes	19	IIe–1	26	1	41
RiB2	Ruston loamy sand, 2 to 5 percent slopes, eroded	19	IIe–1	26	1	41
RiC2	Ruston loamy sand, 5 to 8 percent slopes, eroded	19	IIIe–1	28	1	41
RjB	Ruston loamy sand, thick surface, 2 to 5 percent slopes	19	IIs–1	27	1	41
RjC	Ruston loamy sand, thick surface, 5 to 8 percent slopes	20	IIIe–5	29	1	41
SiC2	Susquehanna sandy loam, 2 to 8 percent slopes, eroded	21	VIe–2	34	6	43
SiE2	Susquehanna sandy loam, 8 to 17 percent slopes, eroded	21	VIIe–2	35	6	43
SjC3	Susquehanna sandy clay loam, 2 to 8 percent slopes, severely eroded	21	VIIe–2	35	6	43
SjD3	Susquehanna sandy clay loam, 8 to 12 percent slopes, severely eroded	21	VIIe–2	35	6	43
SkC2	Sandy and clayey land, gently sloping, eroded	20	IVe–4	32	6	43
SkD2	Sandy and clayey land, sloping, eroded	20	VIe–2	34	6	43
SkE3	Sandy and clayey land, strongly sloping, severely eroded	20	VIIe–2	35	6	43
Sok	Sands over kaolinitic deposits	20	VIIe–2	35	6	43
Swa	Swamp	21	VIIw–1	35	(1)	--
TtB	Tifton fine sandy loam, 2 to 5 percent slopes	22	IIe–2	26	1	41
TtB2	Tifton fine sandy loam, 2 to 5 percent slopes, eroded	21	IIe–2	26	1	41
TtC2	Tifton fine sandy loam, 5 to 8 percent slopes, eroded	22	IIIe–2	28	1	41
Wah	Wahee loamy sand	22	IIIw–5	31	2	42
Wat	Wahee loamy sand, thick surface	22	IIIw–5	31	2	42
Weh	Wehadkee silty clay loam	22	IVw–1	33	3	42
Wtl	Wet alluvial land	23	Vw–2	33	3	42

[1] Data insufficient for mapping unit to be assigned woodland suitability group. [2] Capability unit not assigned.

TWIGGS COUNTY, GEORGIA — SHEET NUMBER 1



This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1958.

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TWIGGS COUNTY, GEORGIA — SHEET NUMBER 2

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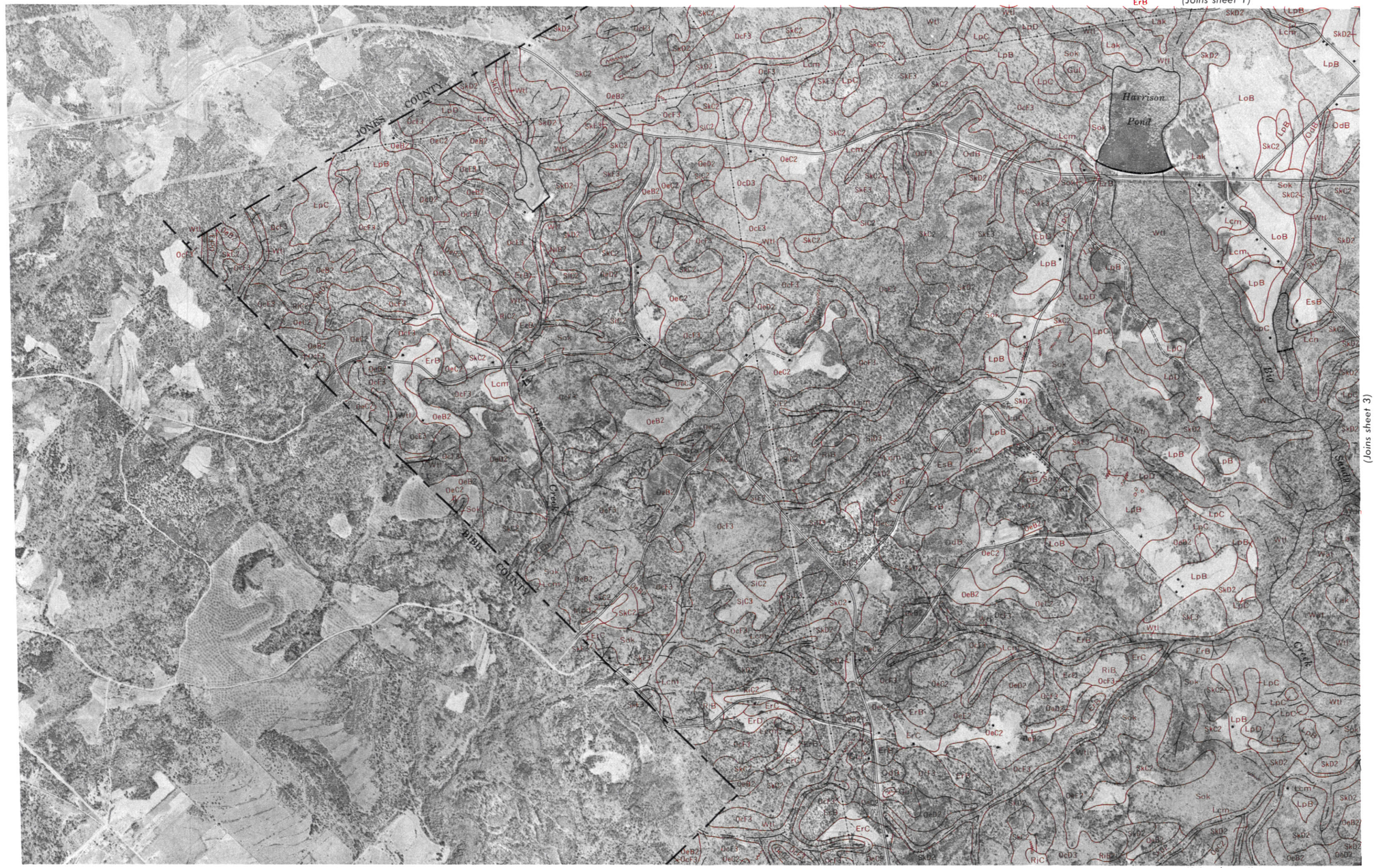

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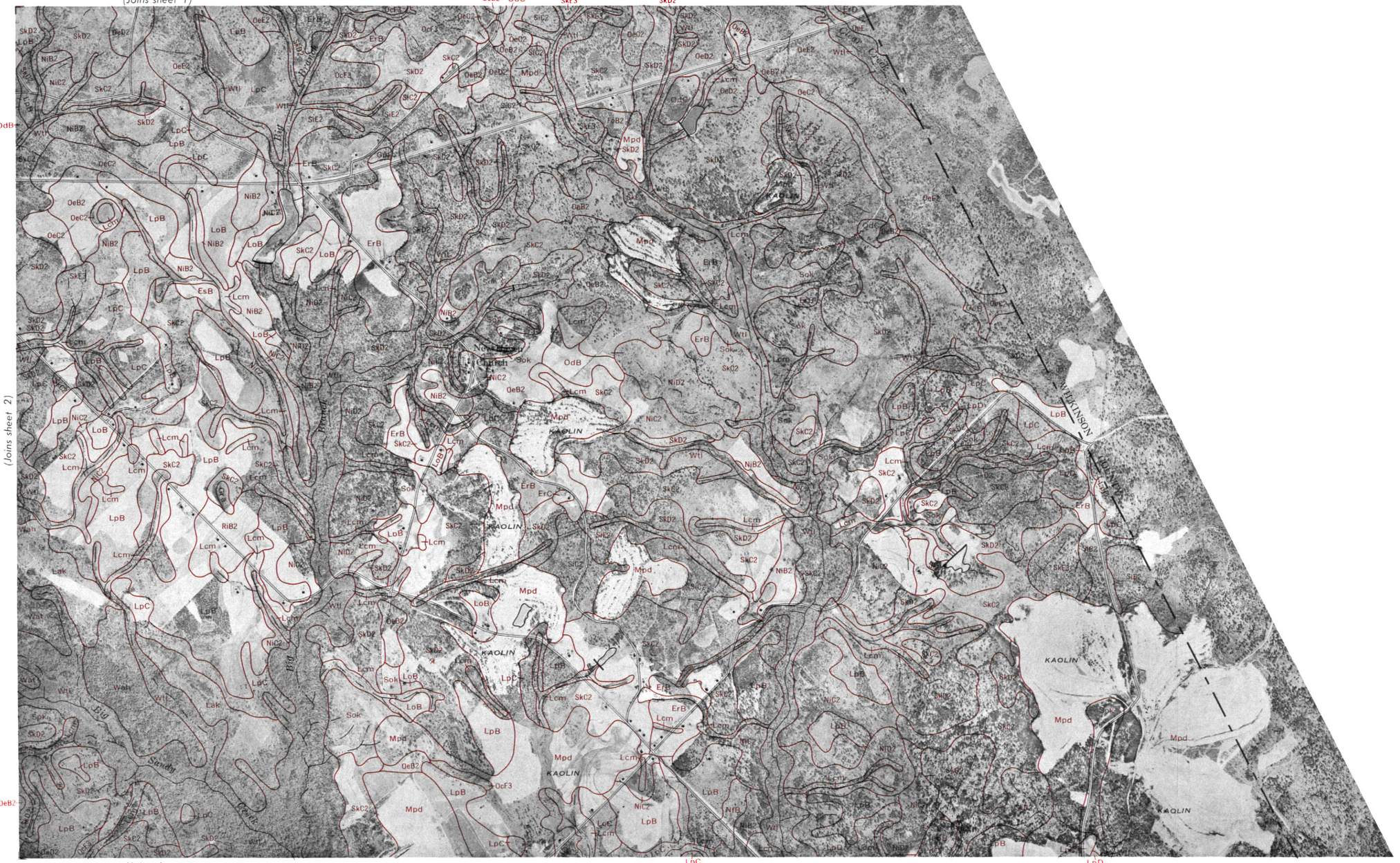

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(4)

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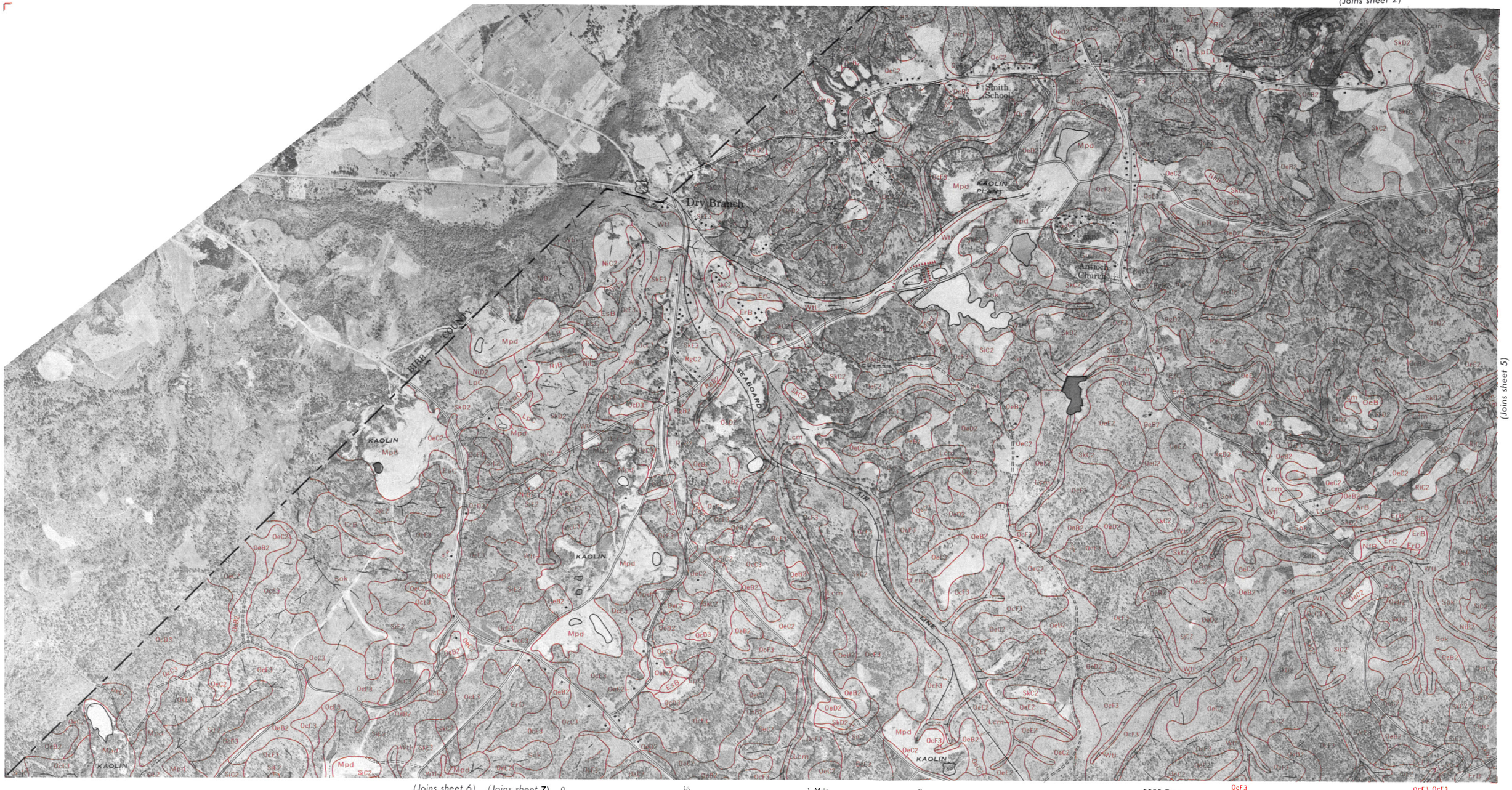

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0 ½ 1 Mile

Scale 1:20 000

0 5000 Feet

TWIGGS COUNTY, GEORGIA — SHEET NUMBER 5

5

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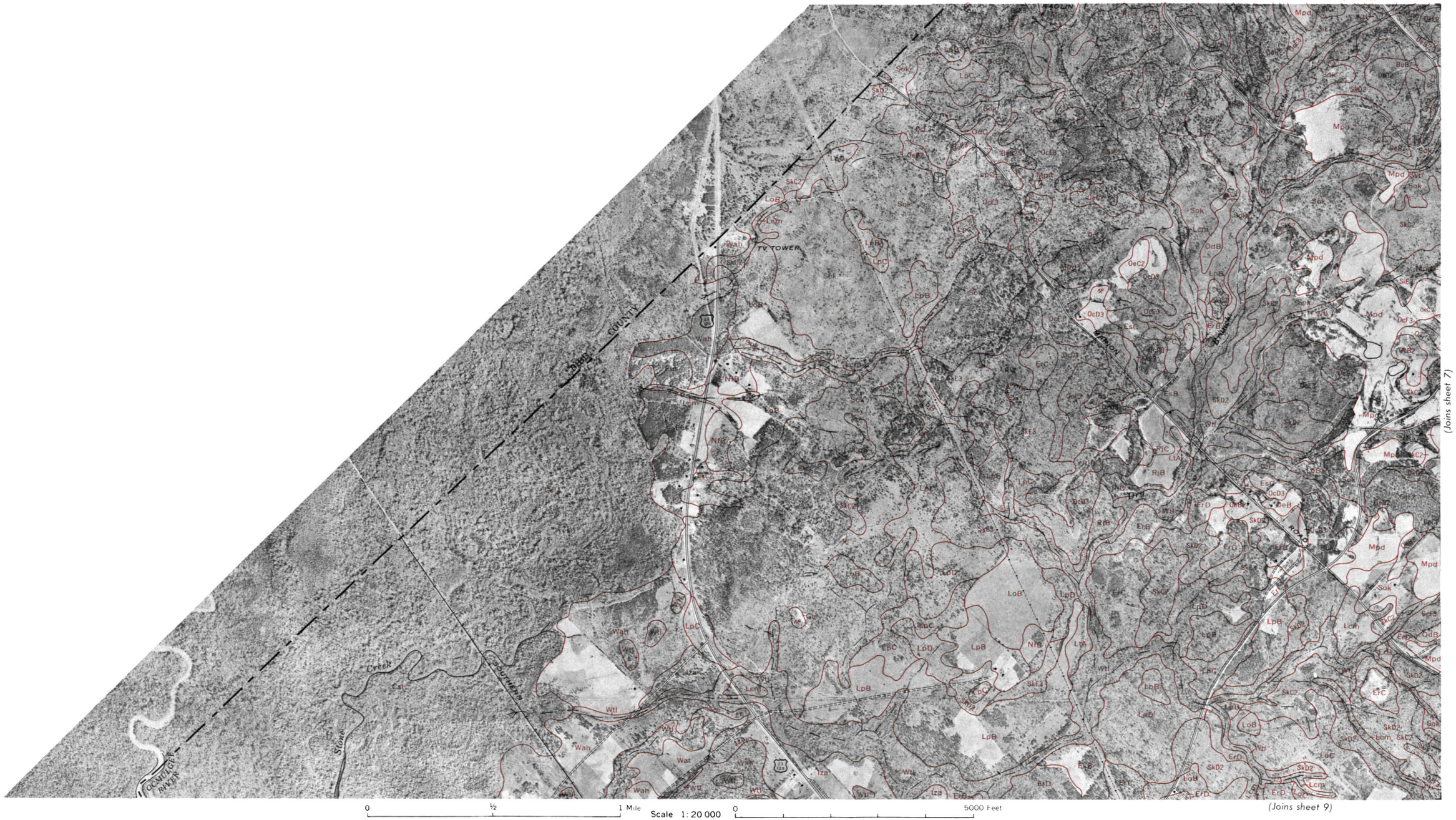
TWIGGS COUNTY, GEORGIA — SHEET NUMBER 6



TWIGGS COUNTY, GEORGIA — SHEET NUMBER 7

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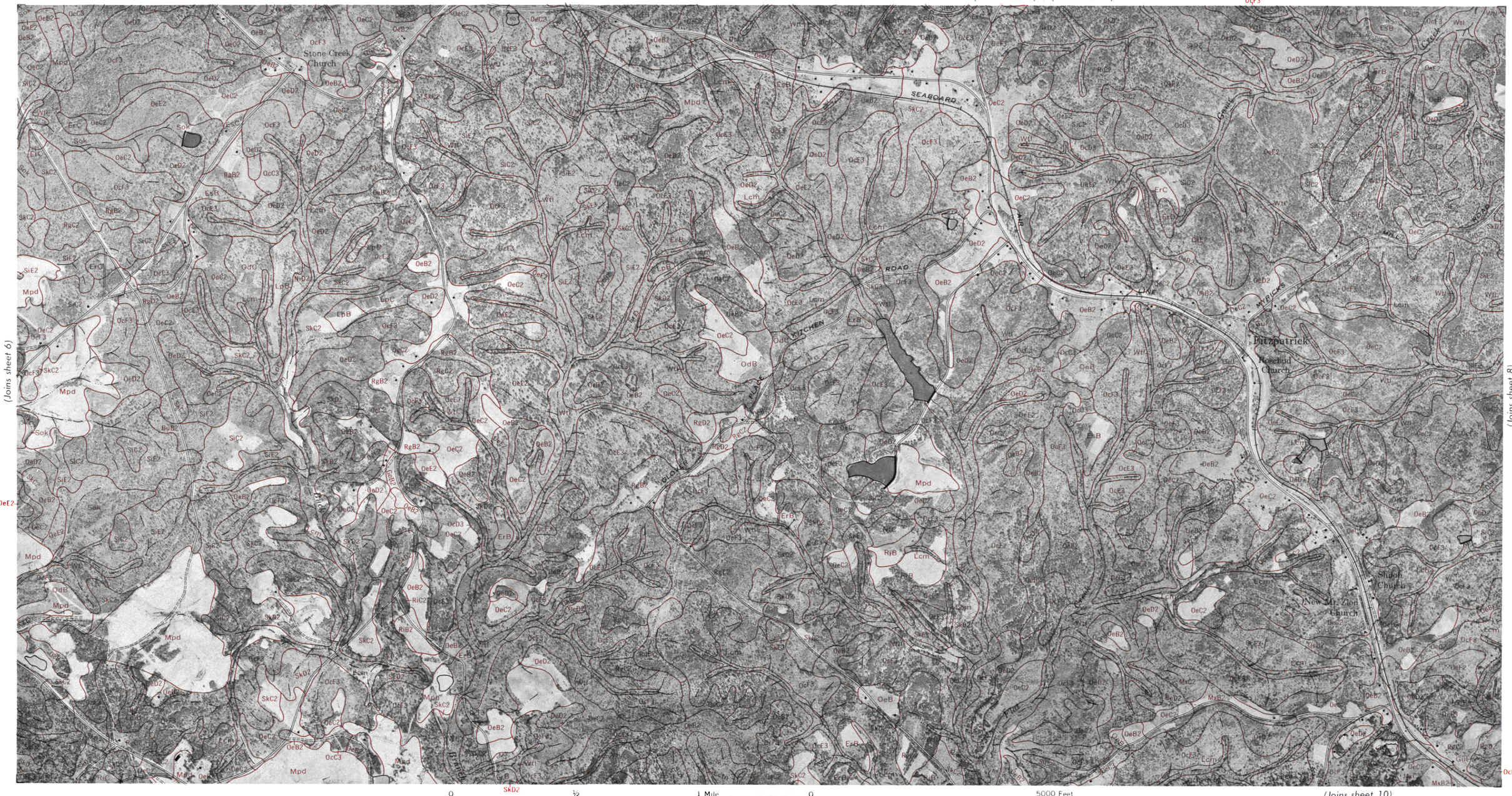

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0 ½ 1 Mile Scale 1: 20 000 0 5000 Feet

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TWIGGS COUNTY, GEORGIA — SHEET NUMBER 8

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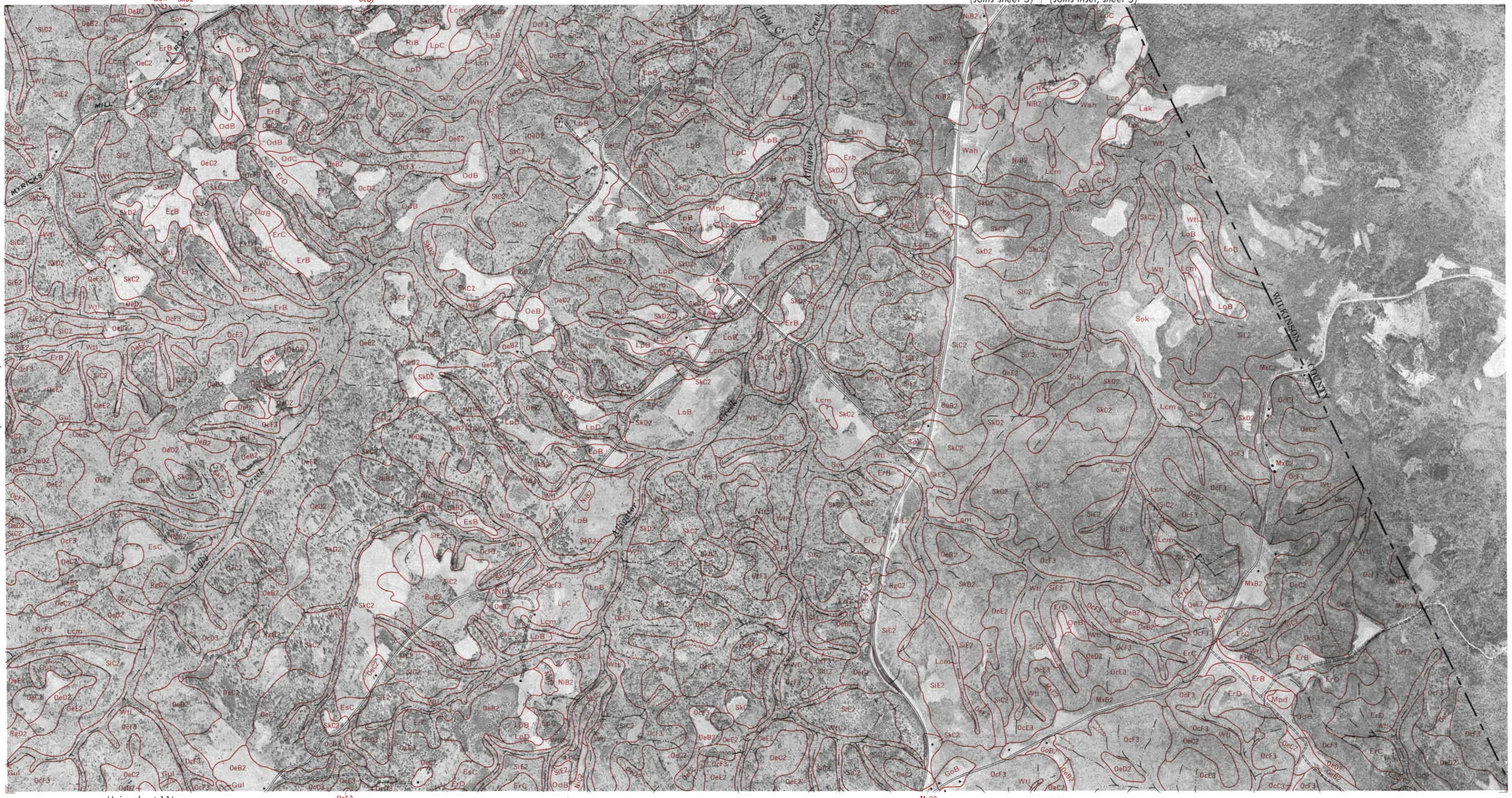

TWIGGS COUNTY, GEORGIA — SHEET NUMBER 9

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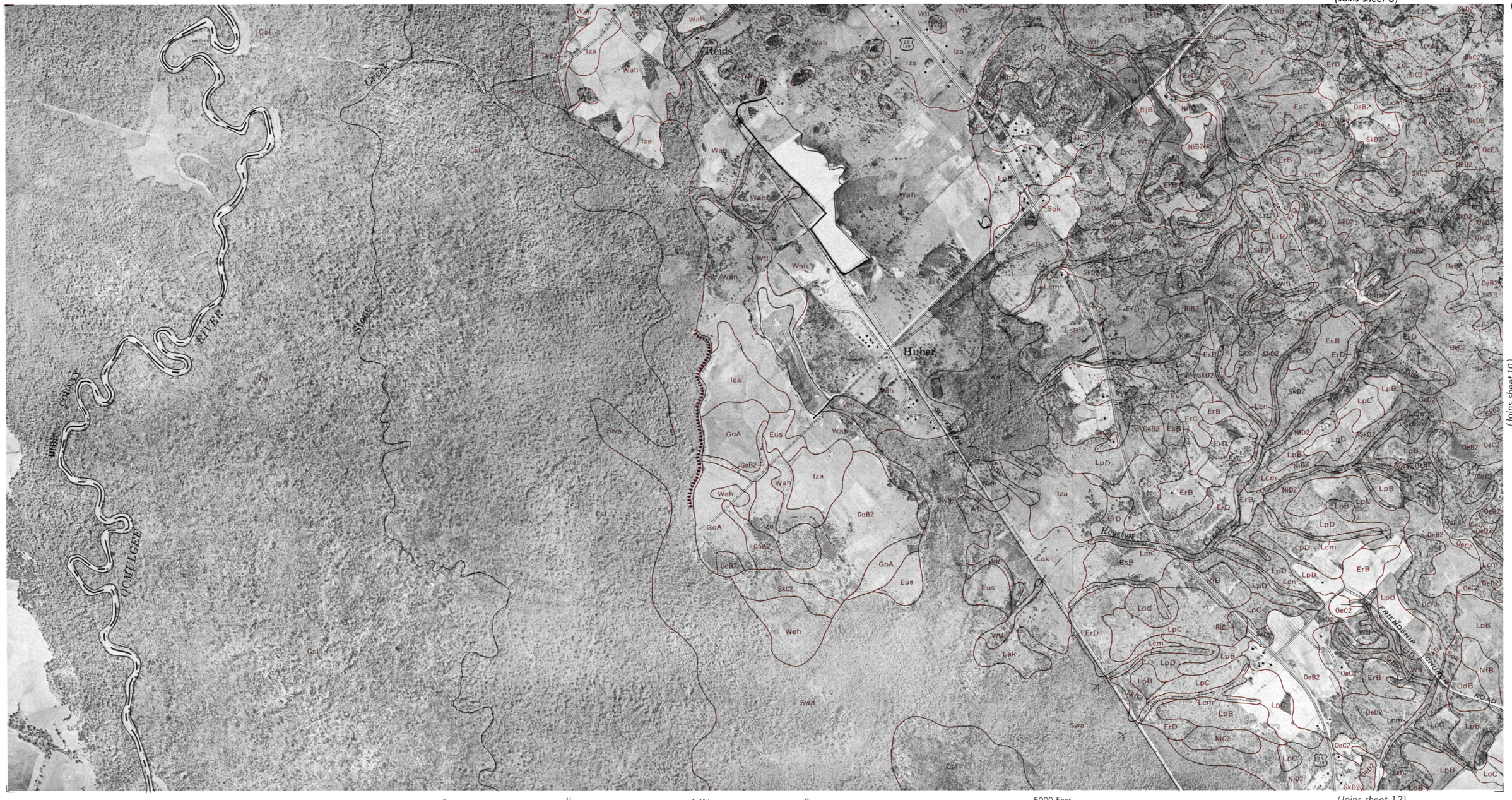

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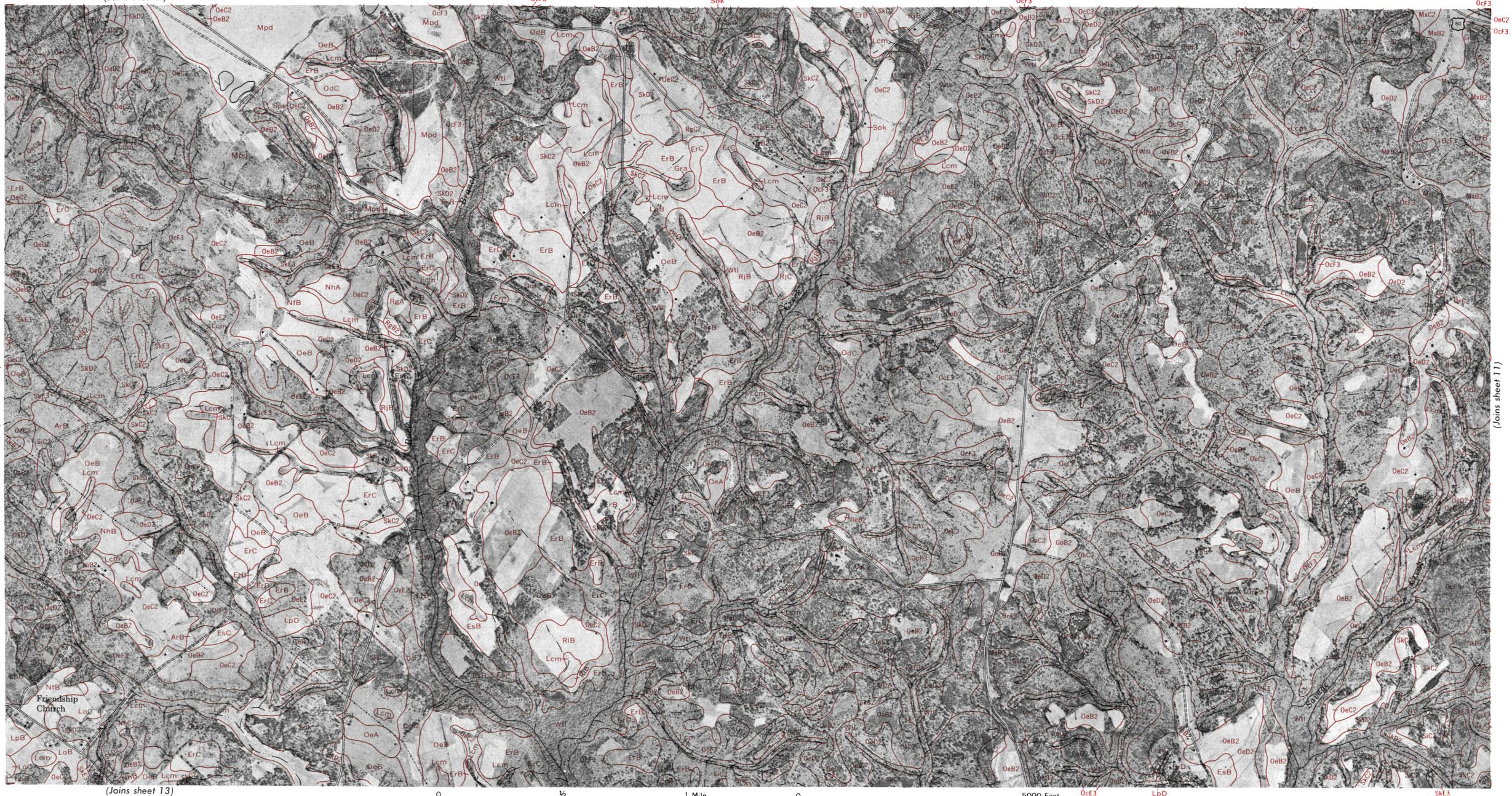

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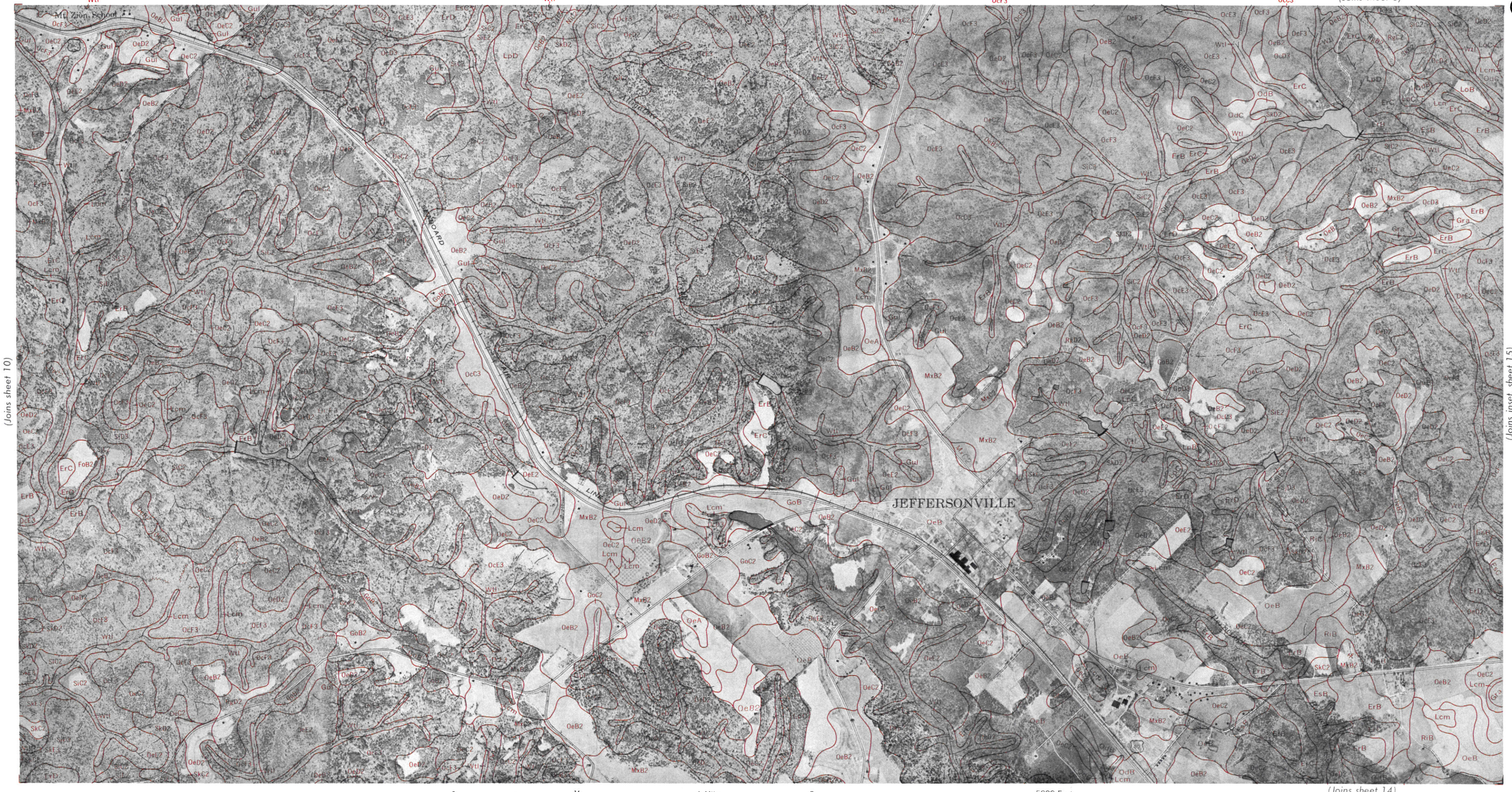

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11

This is one of a set of maps prepared by the Soil Conservation Service, U. S. Department of Agriculture, for a soil survey report of this area. For information regarding the complete soil survey report, write the Soil Conservation Service, U. S. Department of Agriculture, Washington 25, D. C. This map compiled from aerial photographs flown in 1958.

TWIGGS COUNTY, GEORGIA — SHEET NUMBER 12

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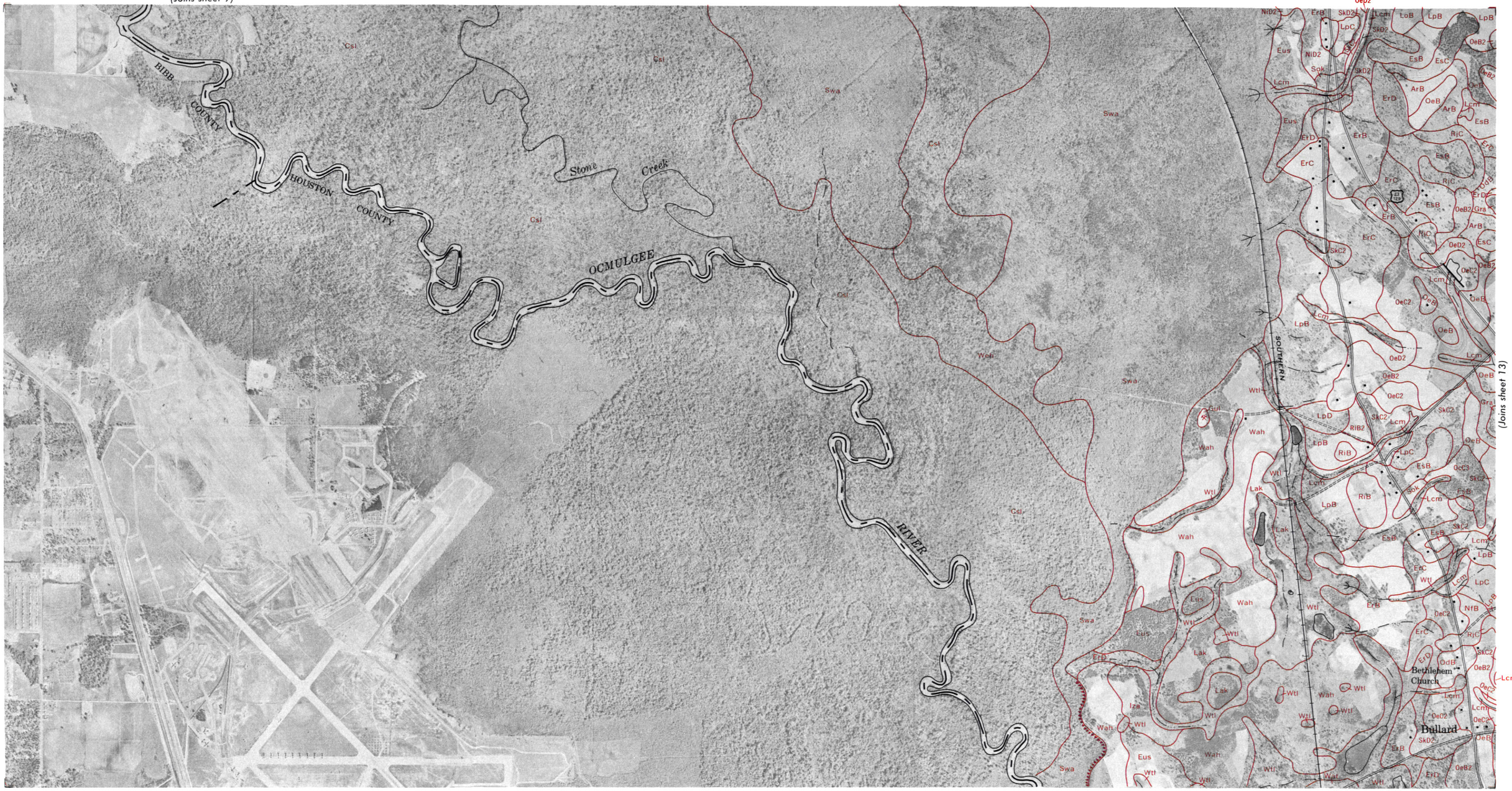

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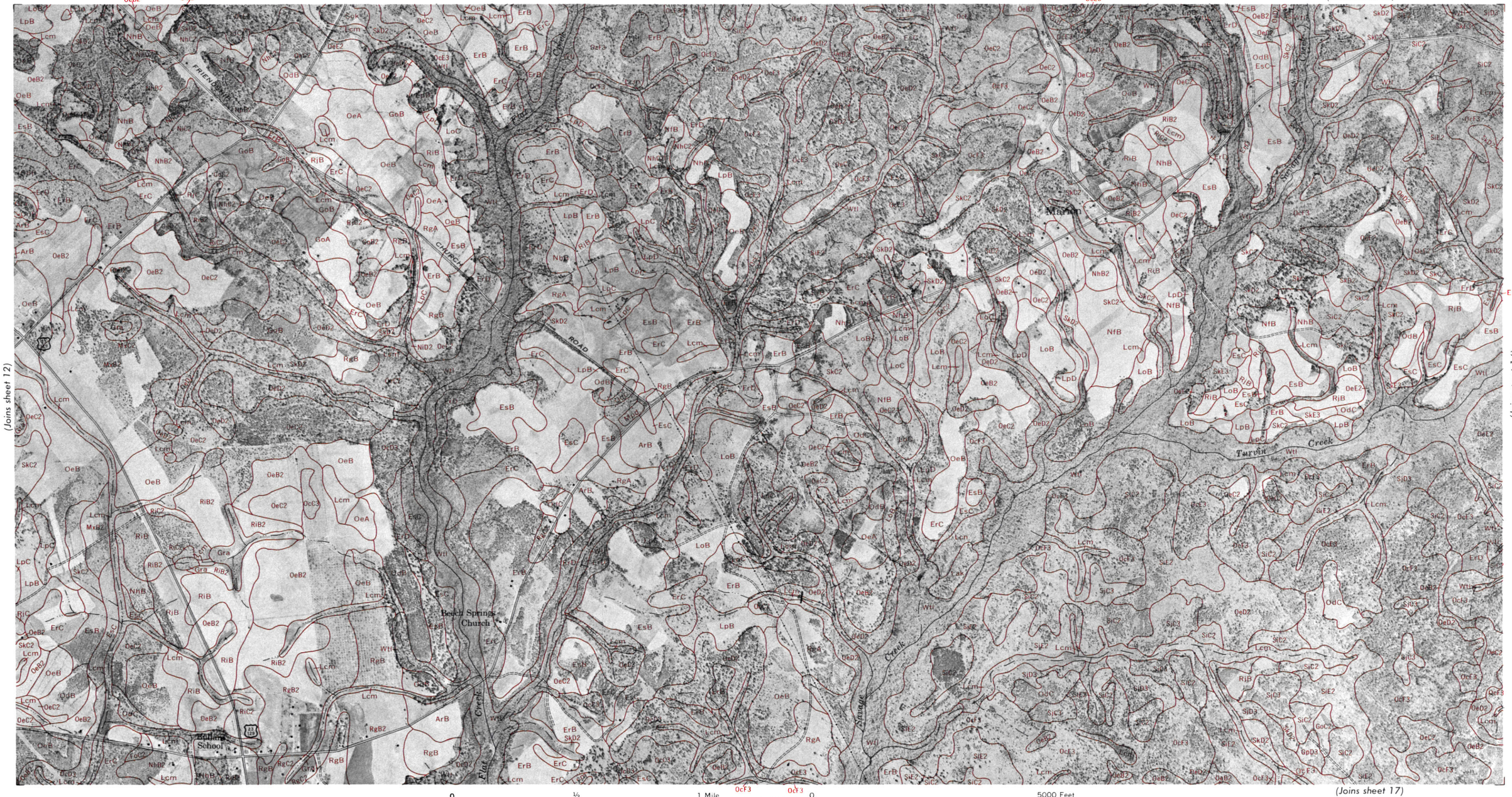

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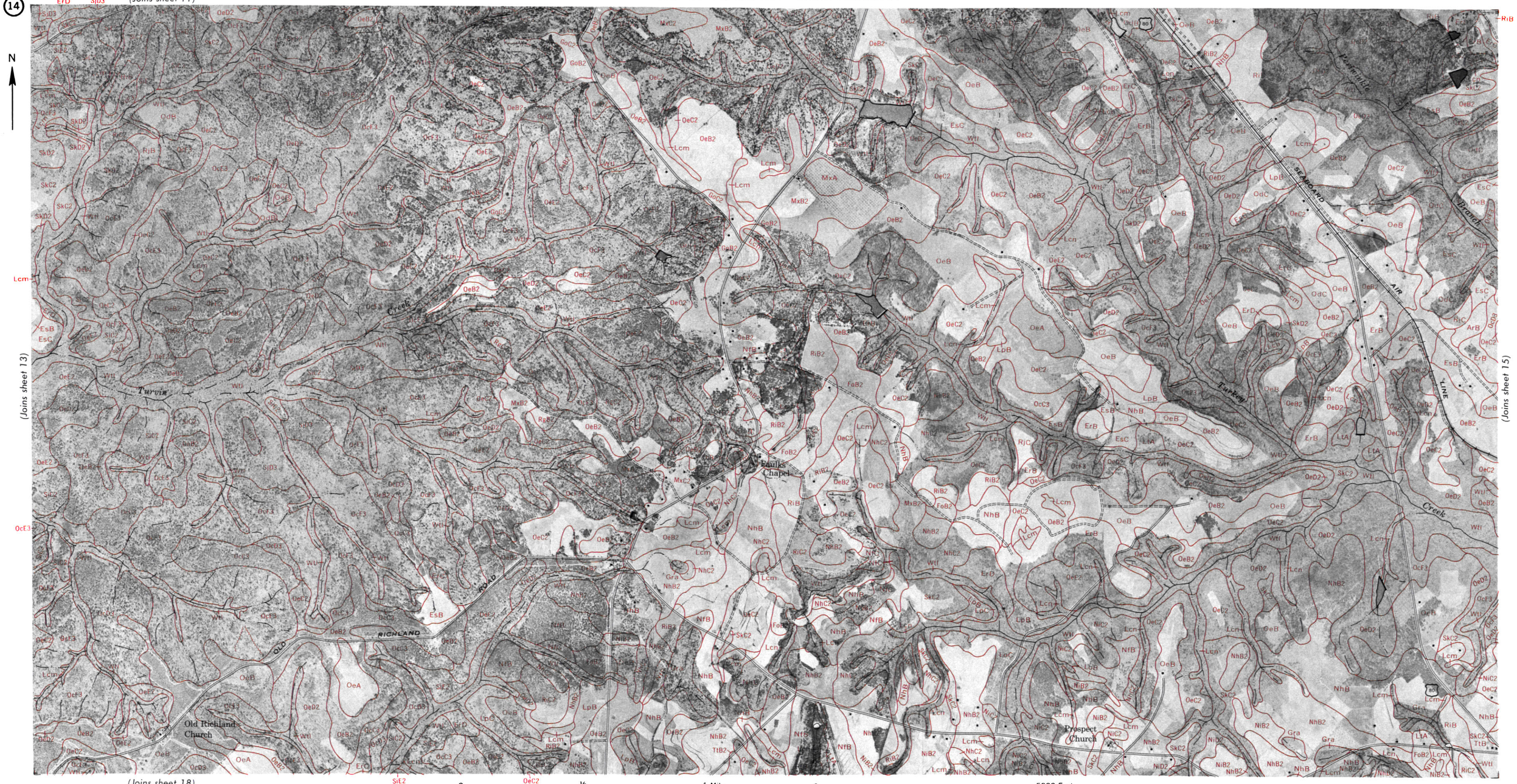
TWIGGS COUNTY, GEORGIA — SHEET NUMBER 14



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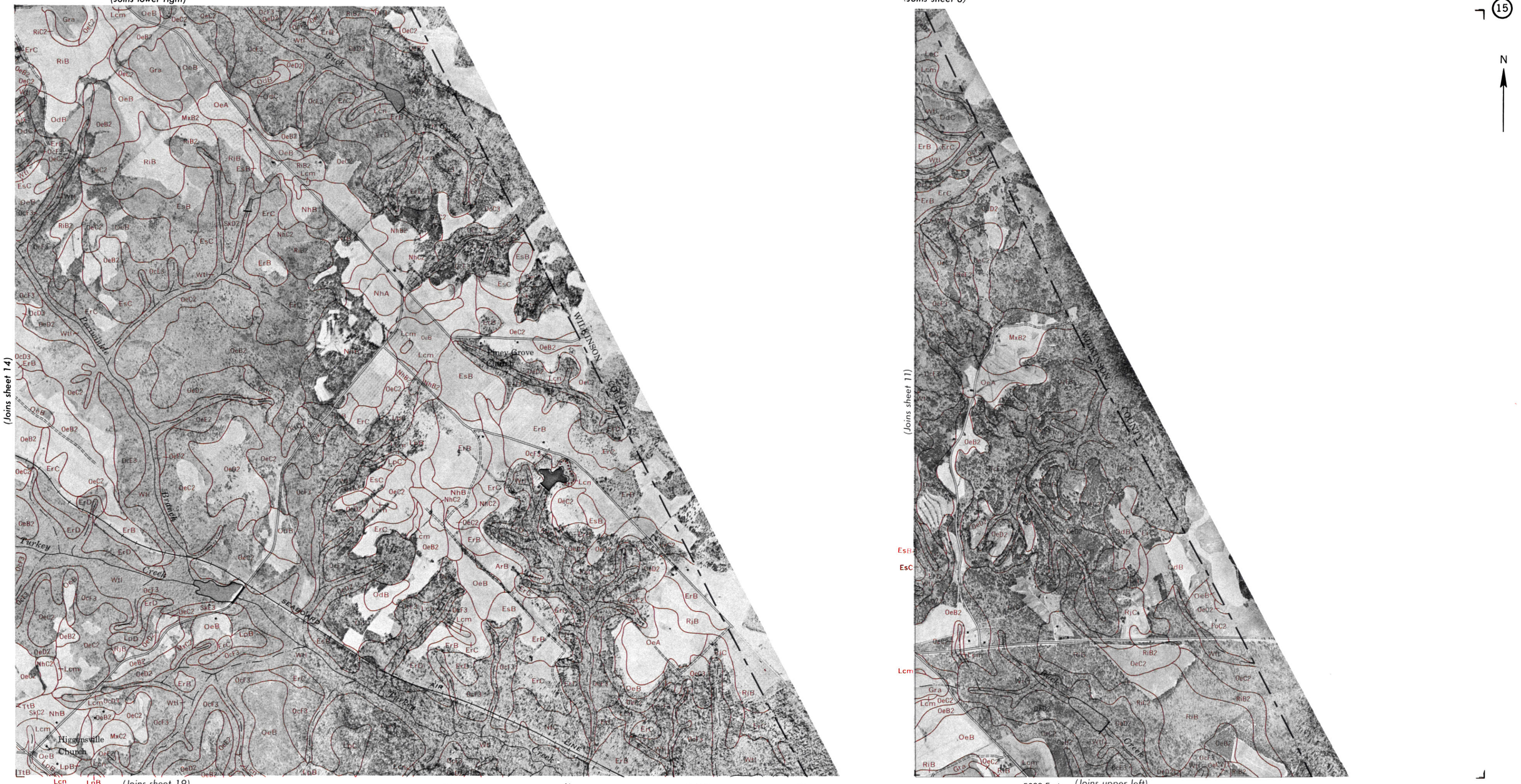

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TWIGGS COUNTY, GEORGIA — SHEET NUMBER 16

16

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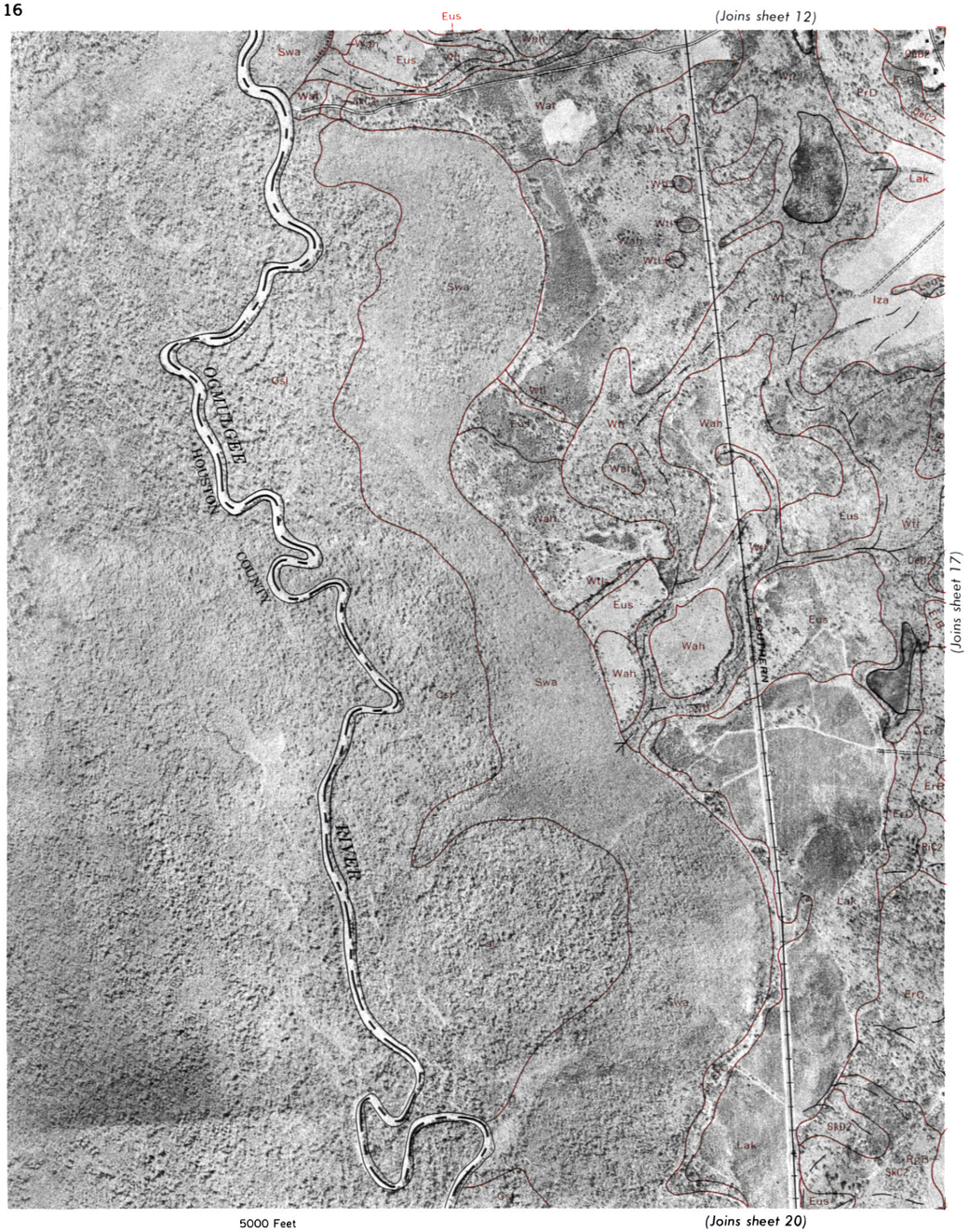

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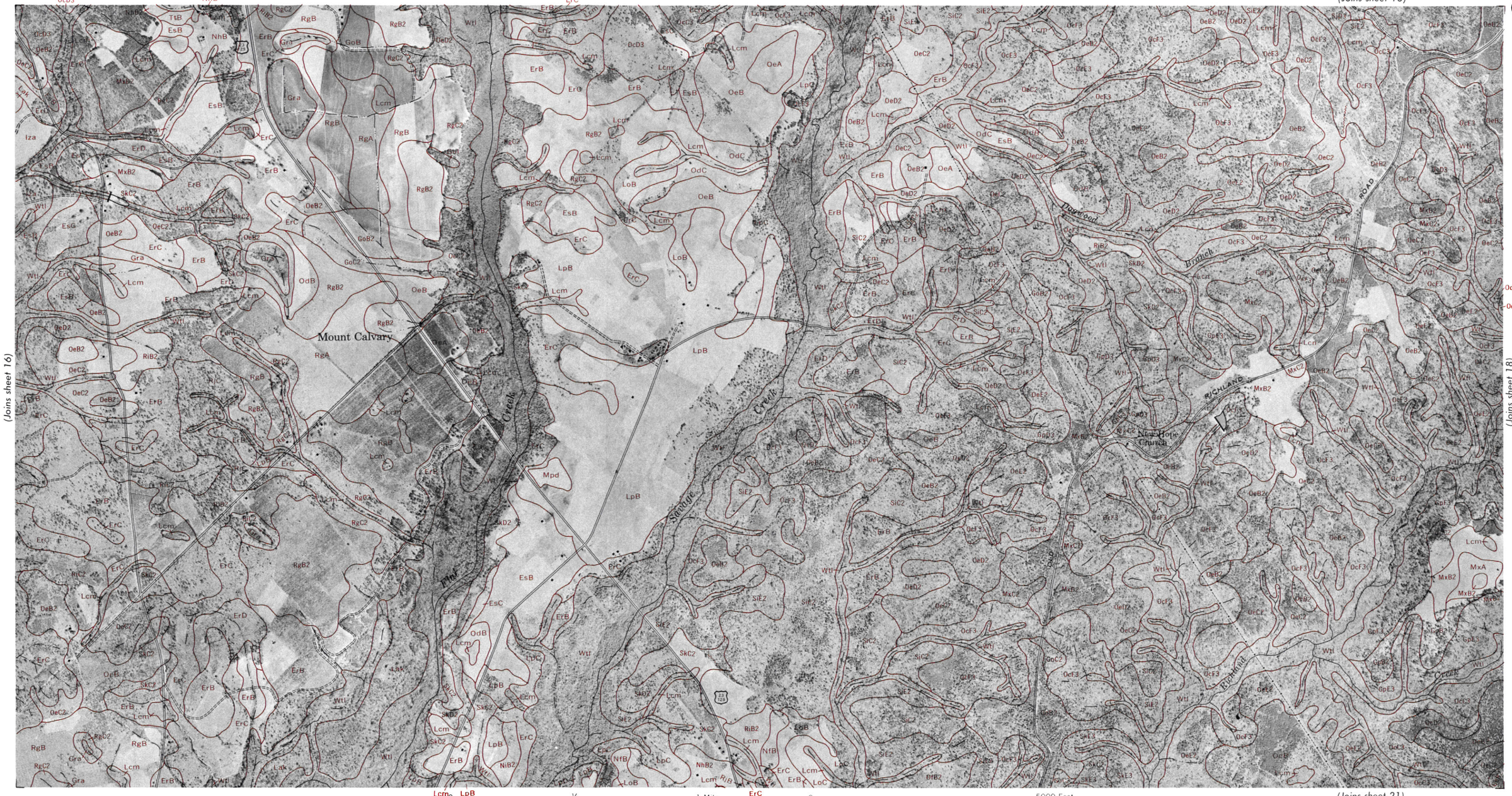

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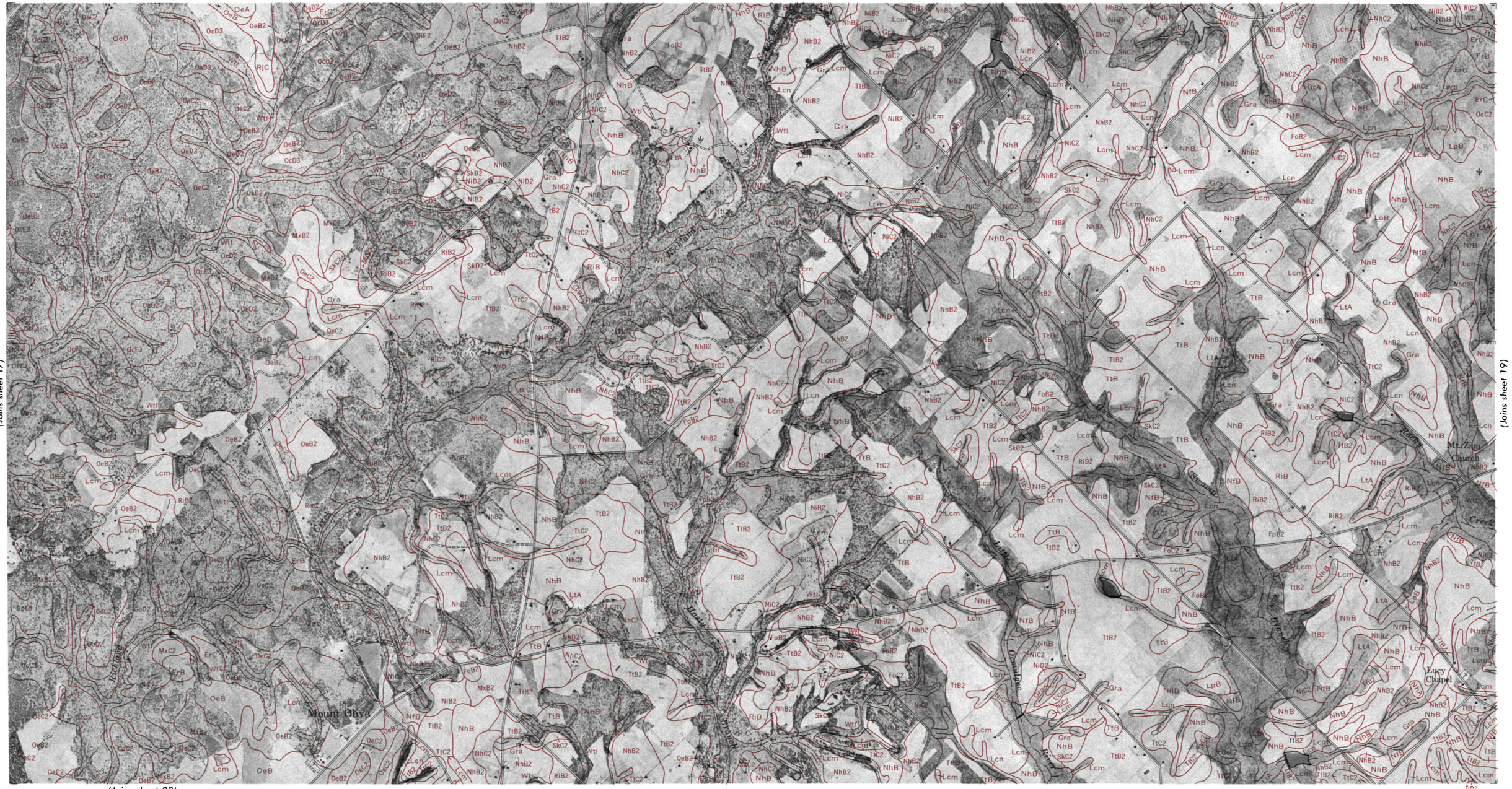

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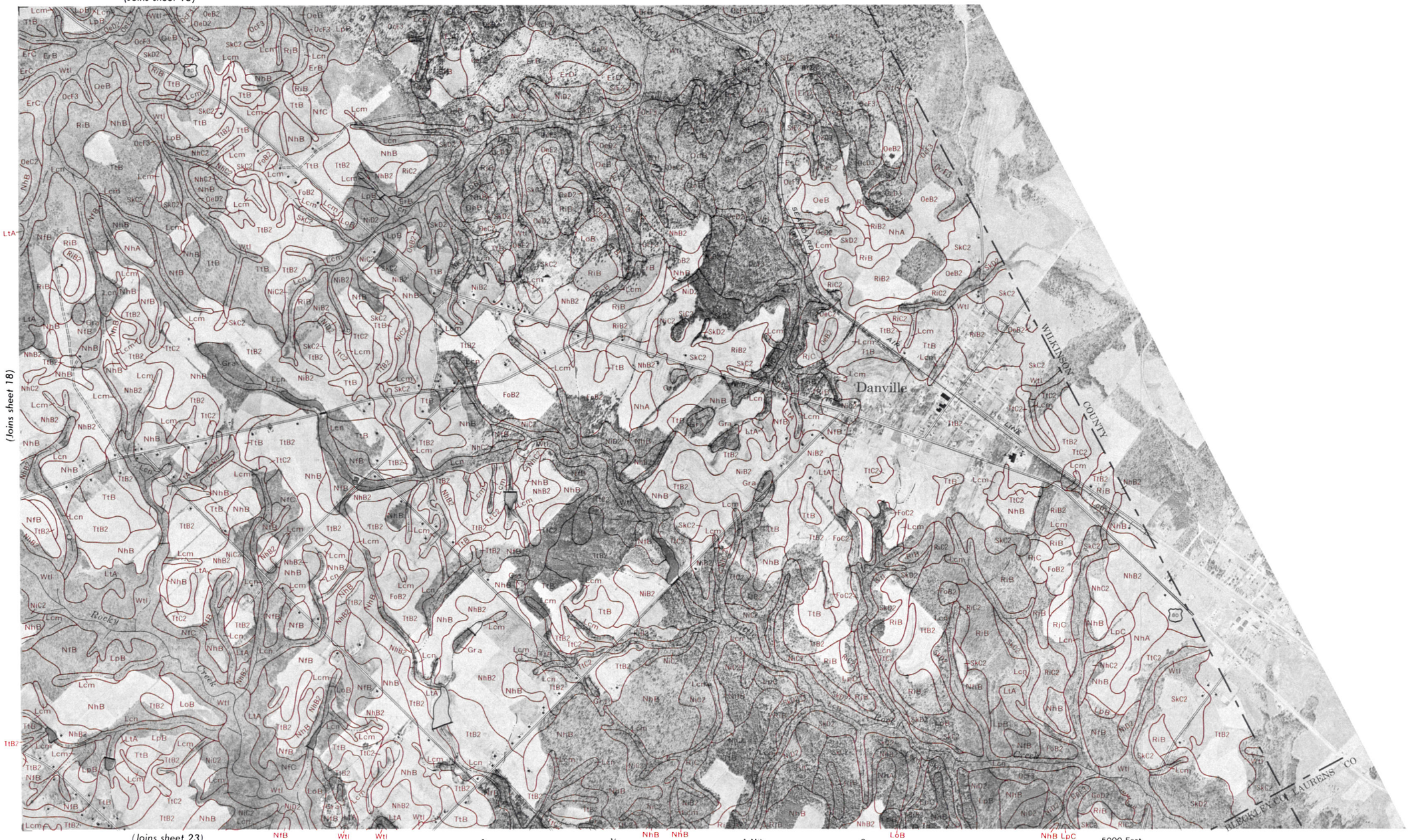

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19

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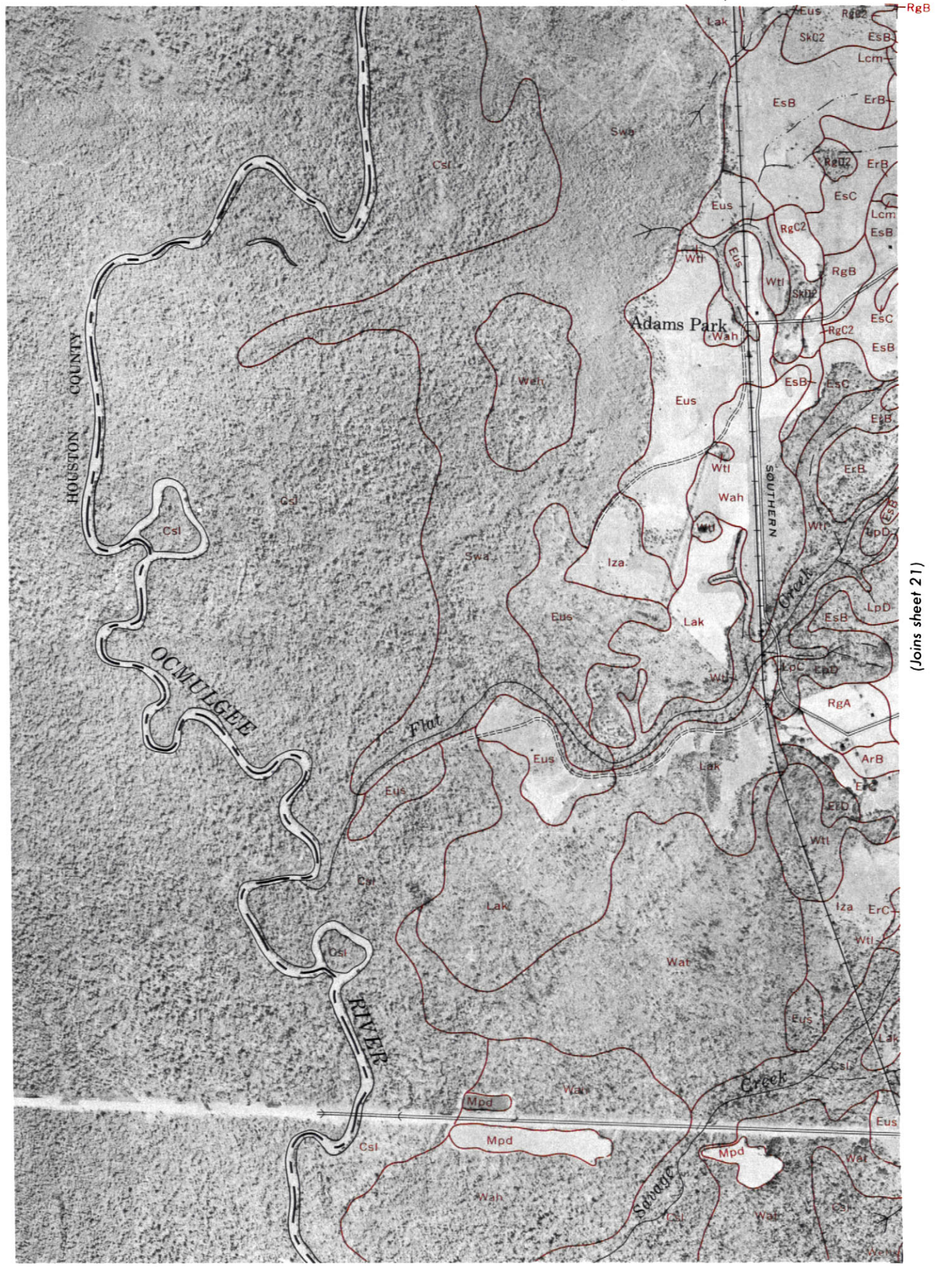

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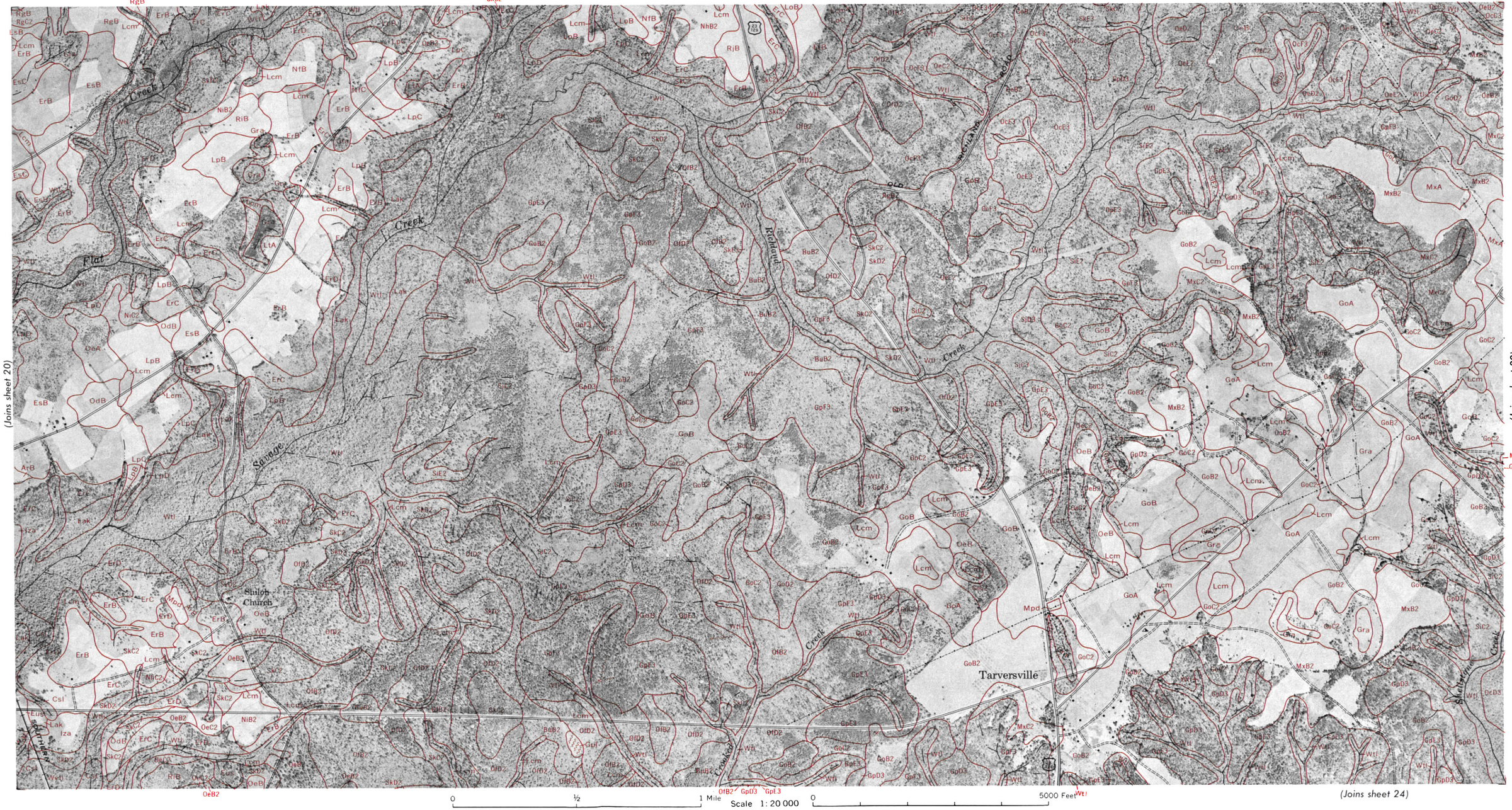

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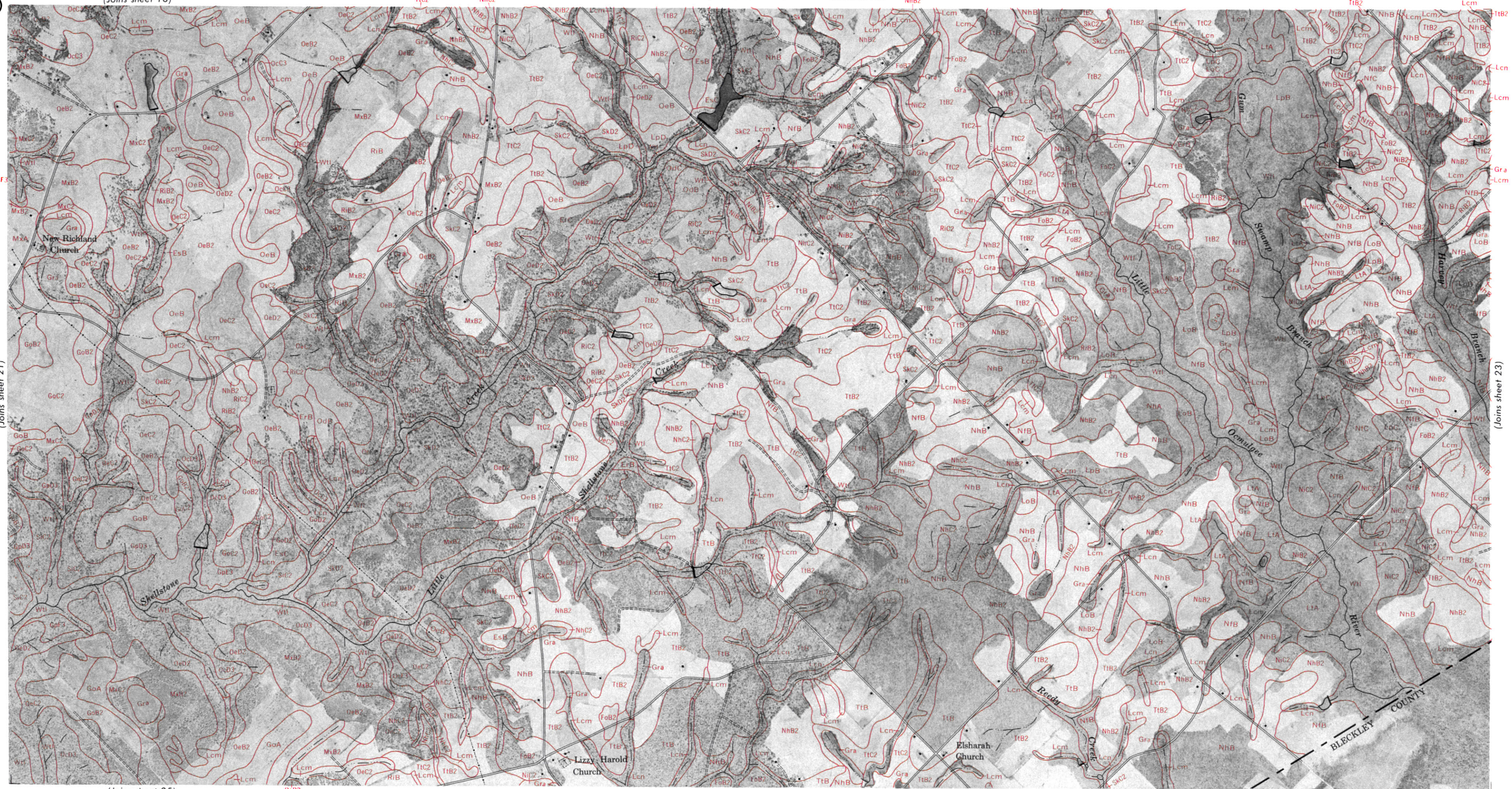

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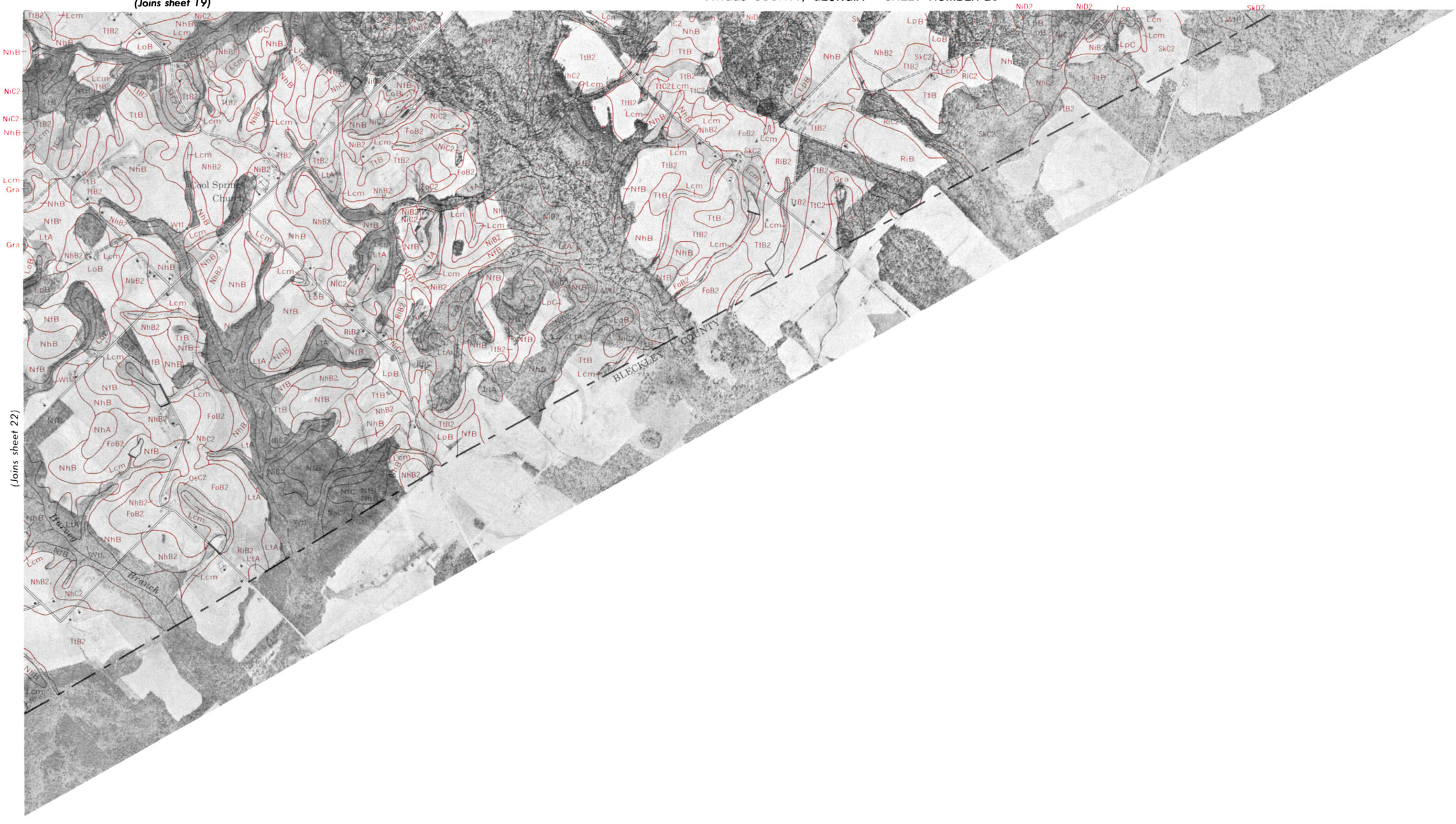

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TWIGGS COUNTY, GEORGIA — SHEET NUMBER 24

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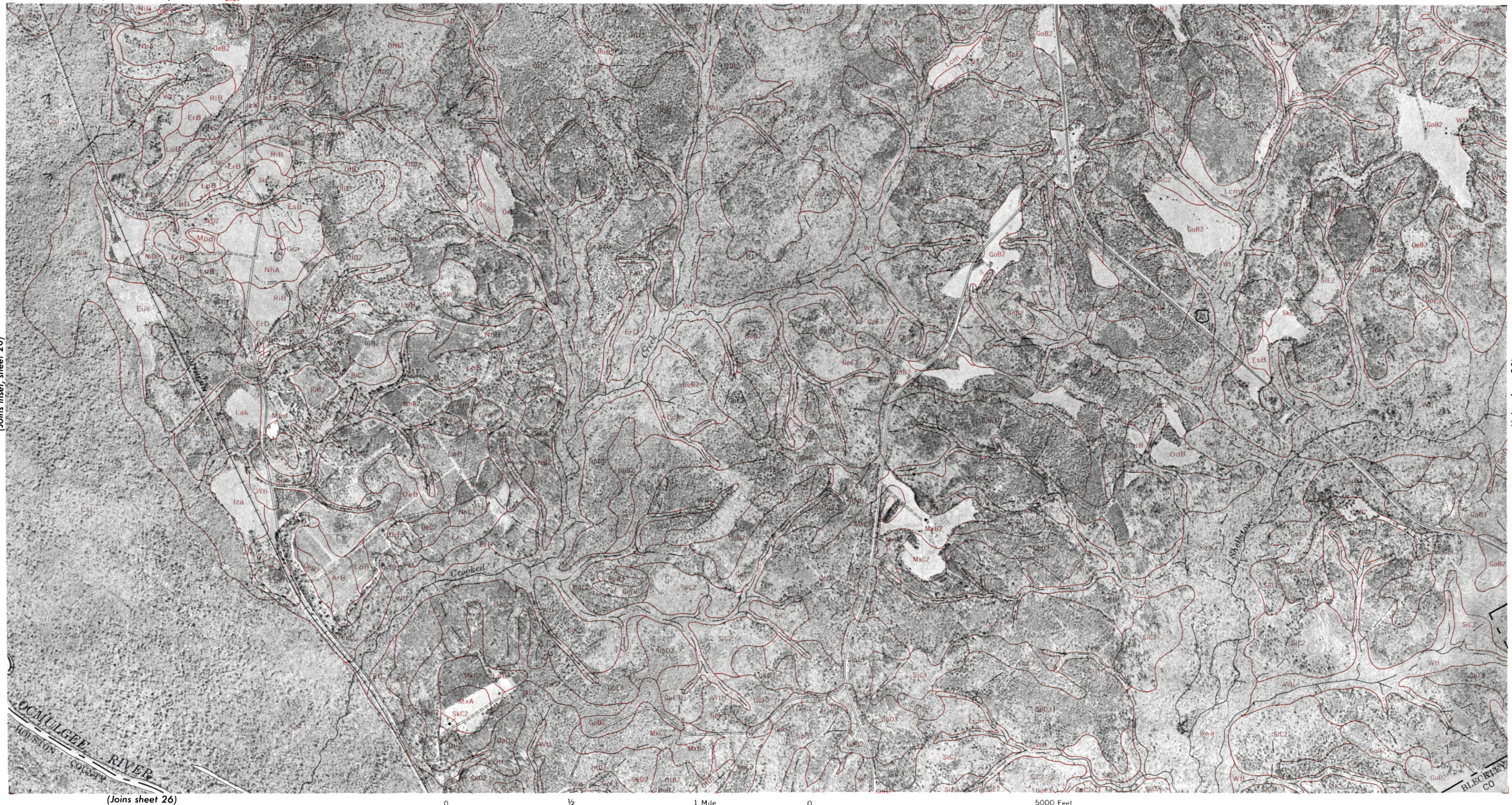

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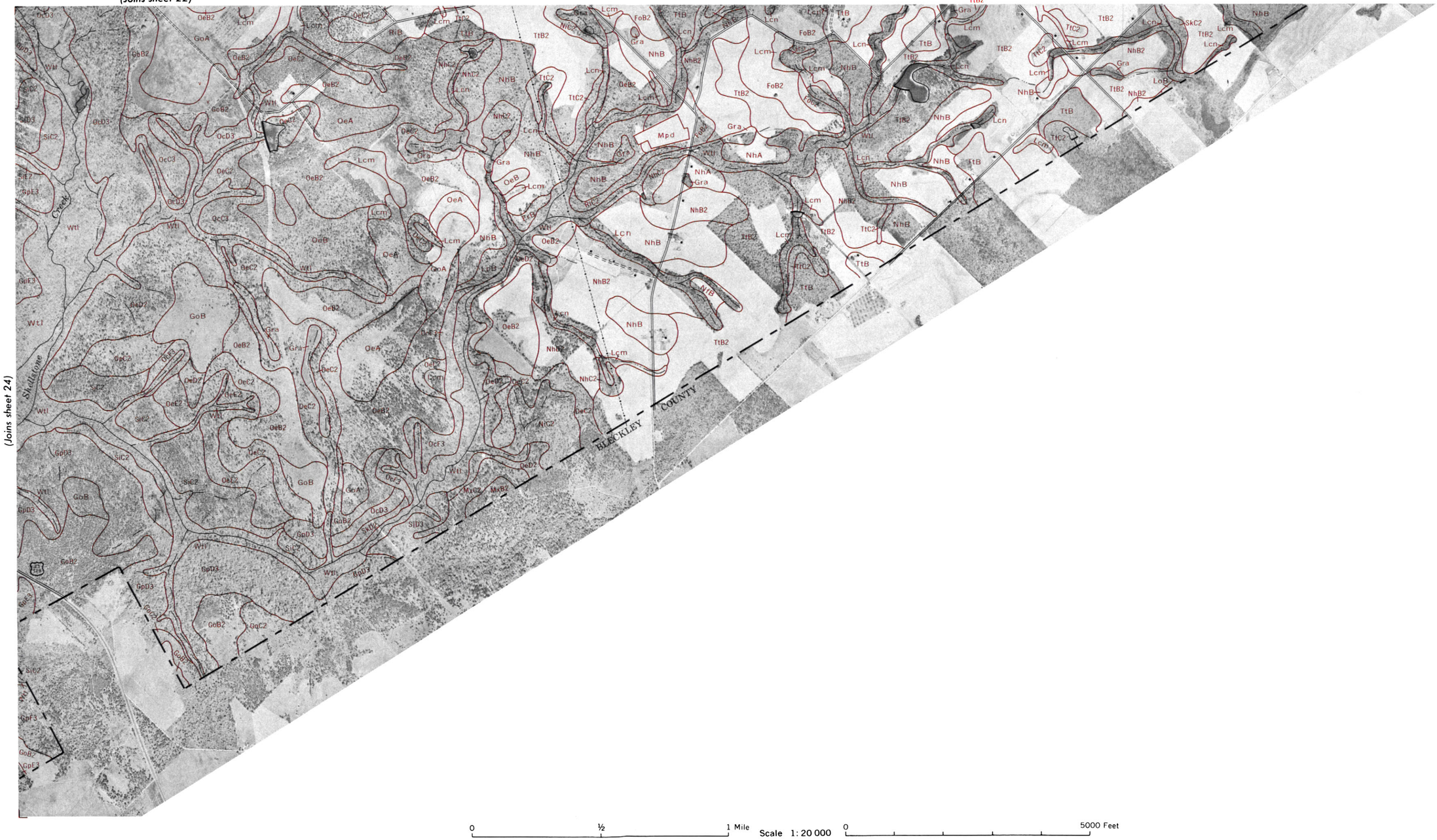

TWIGGS COUNTY, GEORGIA — SHEET NUMBER 26

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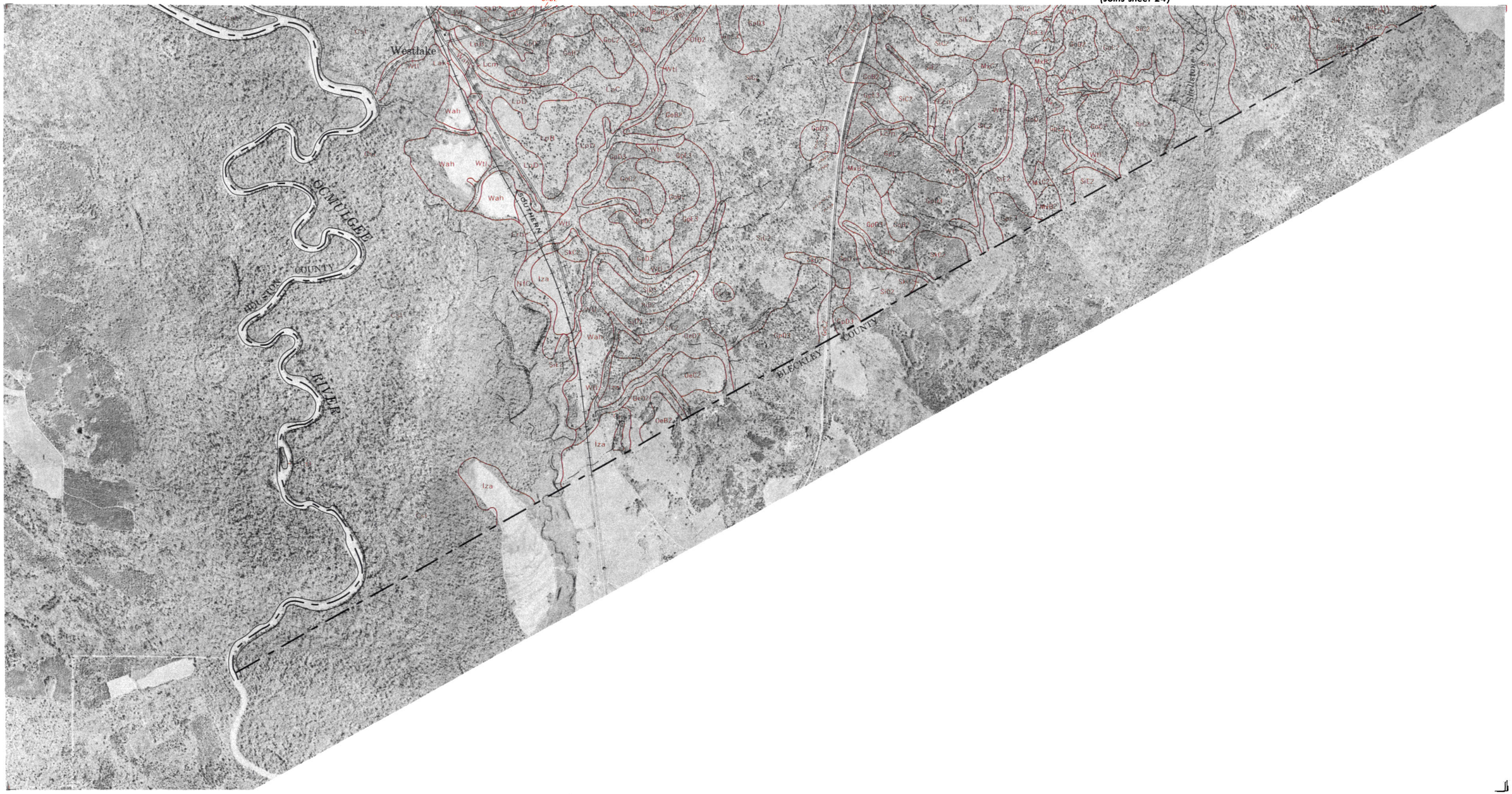

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